

# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society*

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume XVI  
Number 7

JULY, 1933

25 cents a copy  
\$3.00 a year

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VOL. XVI

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## PITFALLS IN CARDIAC DIAGNOSIS\*

CHARLES N. HENSEL, M.D., F.A.C.P.

*Saint Paul*

BEFORE we can understand the symptoms of a disease, it is essential to know the pathological changes produced by the disease and whether these changes are evanescent or permanent. In addition, we must know the etiology and usual clinical course, and further determine how the organ and organism function in the presence of these pathological changes, *i.e.*, the degree of handicap their presence imposes.

Especially during and since the Great War, the field of cardiology has been intensively studied for all of these factors. With a more exact x-ray technic, and a more extensive clinical use of the electrocardiograph, a vast cardiological literature has accumulated. More minute pathological studies of the heart have correlated ante-mortem findings with post-mortem changes, and these have been further correlated by experimentally producing similar lesions in animals and obtaining graphic records.

For nearly a decade, the field of cardiological thinking has been dominated by instruments of precision and a study of cellular pathology. It was a thrilling experience to see an x-ray silhouette, read a cardiogram, and make a diagnosis and prognosis.

We were not lacking in statistical studies to tell us, from analysis of questionnaire letters, just how long these patients with structural damage as evidenced by their graphic records would live. The art of medicine was being displaced by this science of medicine. No more fumbling, no more guesswork, cardiology was coming into its own.

But there was a joker in the pack. These patients were not always handicapped as the graphic records suggested they should be; and they did not accommodately die when statistical

studies prophesied they should. An unforeseen factor entered the picture to spoil our theories and make us doubt whether cardiology belonged in the realm of pure science after all. That factor was time, the true developer of understanding and the mellow of wisdom. We found that in spite of all our studies and the revelations that instruments of precision had given us, we were still just as unable to foretell the day of a man's death as were the wondering prophets in the Biblical days of old.

There must then exist a quality of vitality, an inherent residuum of functional capacity, as yet not measurable by scientific methods. True, our grasp of cardiological problems had been immeasurably broadened and deepened by this instrumental approach with its experimental research; and our clinical handling and pharmaceutical attack had been rendered more efficient and direct and more adequately controlled, but the aims of the pioneers, perhaps I should rather say their hope, implied rather than directly expressed, had failed to materialize.

The crippled heart, structurally defective, as instrumental studies repeatedly revealed, continued to function, to carry on, to enable its possessor to do his limited daily work.

Those of us whose interest in heart problems antedates this newly developed science of cardiology, occasionally, with a feeling akin almost to foolhardiness, trusted our clinical estimation of the patient's cardiac capacity and advised necessary operative procedures, and were rewarded with a successful outcome.

Out of such experience has been built up the belief that, at least in the field of cardiology, the art of medical practice still dominates the science, that while the science, so called, tells us of structural damage, and predicates trends, the art,

\*Thesis presented before the Minnesota Academy of Medicine, November 9, 1933.

built up from years of experience, must guide us in advising the patient.

Years ago Emerson stated that all increase in knowledge could be expressed by the "Law of the Ascending Spiral." Starting from the initial point and sweeping forward in a wide circle of supposedly newly acquired facts and experience, trying this and abandoning that, we eventually return nearly to the original starting point, with but a slight increment of knowledge, which had raised us an iota above the initial level. Cannot we apply this same law to our excursions in the field of cardiology?

When the swing around the circle started, we began to forget much of the accumulated empirical wisdom of our earlier cardiological forebears, but as we are inevitably returning to our starting point, we now find that we have added but a small increment of wisdom and must still retain much of what they left us as an accumulated heritage.

What does the present inventory disclose? A vast amount of empirical wisdom and a modicum of fresh factual addenda, with the result that, despite our present day more exact knowledge of structural cardiac damage, an estimate of the damaged heart's functional capacity still is the important consideration.

Thus, I come to the crux of my thesis, *the estimation of the functional capacity of the heart.*

The normal heart inevitably functions automatically and without somatic sensations in the normal individual. The diseased heart may or may not function without making its possessor aware of its activity.

Sensory awareness of cardiac activity may arise from several causes. A normal individual with a normal heart in anticipation of an athletic contest may have an automatic acceleration of his heart action to perhaps 120 beats per minute through anticipatory excitement, which acceleration prepares him for the necessary increased muscular activity, the degree of rise in the heart rate, of course, depending on the previous training and also on the sensitivity of the individual's nervous system.

The activity of the affected heart, with a compensated quiescent healed mitral valvulitis, will be more violent in its anticipatory response, but even then its increased activity may not make itself manifest. The frequency with which in draft board applicants we encountered compen-

sated valve defects, of which the possessors were unaware, attests to this. Therefore, the mere finding of a compensated valve defect does not predicate the diagnosis of active heart disease and indicate treatment. Our duty merely lies in estimating the percentage of physical handicap, if any, and advising the patient accordingly.

In order to simplify the detailed discussion to follow, let me divide the field of heart disease into three large groups.

#### I. Infectious

Rheumatic

Polyarthrititis

Tonsilitis

Chorea, etc.

Subacute bacterial endocarditis

Syphilis

#### II. Toxic

Hyperthyroidism

Other causes

#### III. Degenerative

Coronary sclerosis, alone

Heart disease associated with or secondary to systemic disease, *i.e.*

Arteriosclerosis

Chronic nephritis

Diabetes

Emphysema

Hypertension

Anemia, etc.

There is an additional questionable group in which the heart, not primarily diseased, is played upon by emotional and nervous stimuli, and responds by increased activity irrespective of physical need—the so-called irritable heart.

The infectious type (exclusive of syphilis, the cardiac effects of which appear usually after forty years of age) is chiefly a disease of youth up to the age of thirty-five years, attacking the heart often as a pancarditis, involving endo-, myo- and pericardium, the brunt of the attacks usually falling on the endocardium, and resulting in scarring of valve edges and shortening of the chordae tendinae.

The mitral is the usual valve affected and an insufficiency the commonest result. The aortic valve is less frequently affected, usually only after two or more attacks of rheumatic fever, and then associated with a mitral valvulitis, the resulting defect being an aortic insufficiency.

Occasionally, the rheumatic process selects only the aortic valve and the resulting insuffi-



ciency must then be differentiated from that due to syphilis. Patients with rheumatic endocarditis usually survive. The mere finding of a mitral valve defect, fully compensated, as evidenced by a systolic murmur heard over the apex and an accentuated pulmonic second tone, does not, merely by its presence, signify that treatment is necessary.

When the rheumatic valvulitis has gone on to extensive scarring with resulting narrowing of the valve orifice (mitral stenosis) then we have to deal with one of the most crippling of valve lesions and the problem is one of a handicapped individual, who is perpetually a cardiopath.

It is the non-crippling scar on the mitral valve producing a systolic murmur over the apex and base with an accentuated pulmonic second sound that seems to lead so many practitioners astray. Why is it that we can allow a patient to recover from typhoid fever or from pneumonia, but we cannot allow him to recover from a rheumatic endocarditis? Scars must remain in the intestine following typhoid and in the lungs following pneumonia, but we cannot see them (except as some possible fibrous increase in the lung design as revealed by the x-ray) but since the individual looks well and feels well, and is able to live his usual life, we do not bother about these scars. Where the heart is concerned, our attitude is entirely different.

An individual may have recovered from a previous rheumatic fever, associated during its course with mitral valvulitis of moderate degree, leaving a slight scar on the valve which prevents perfectly tight closure.

Fortunately, the myocardium and pericardium often escape with no demonstrable damage and the muscle of the left ventricle and left auricle hypertrophies to counteract the slight valve defect and the individual is able to carry on his normal life's activities without any handicap, usually unaware that anything is amiss, until, during the course of some general examination, the physician's stethoscope detects a mitral systolic murmur over the apex. At this moment the patient's future activity and peace of mind may hang in the balance. If the examining physician, impressed by the sounds his stethoscope brings to his ears and intent on proving his erudition, tells the patient, "You have a heart murmur from a leaky valve," and if, in addition to finding that murmur, the physician notes an accelerated heart

rate (perhaps induced by the excitement attendant upon the examination) and concludes that the condition needs treatment, prescribes rest, or restricted activity and digitalis, then, depending on the impressionability of the individual, the brand "Heart Disease" is burned into this patient's consciousness and the possible cardiopath is converted into the cardio-neuropath and "the last state of that patient is worse than the first."

Medical knowledge of a generation or two ago comes to be household knowledge of today, with this reservation, namely, the average layman's lack of capacity for understanding and applying facts concerning himself. The newspapers and lay magazines now contain a multiplicity of articles on matters of health and the frequently stressed fact that heart disease is on the increase and is now the major cause of death. What happens when a patient is told he has heart disease? He takes it as an ominous portent of eventual sudden death. This belief of the portentousness of heart disease being the heritage of a former medical belief (and now a part of the layman's belief) dates back to an earlier time when physicians lacked the aid of instruments of precision for better differentiating between the various types of heart disease; when we tolerated focal infections and allowed them to continue to work their devastating effects; when we confused the anginal syndrome with coronary infarction. Therefore, when finding a systolic murmur at the apex we say to the patient, "You have heart disease," we may set in train a correlation of the ideas above detailed, and may induce into the individual's consciousness a fear of sudden death, handicap his previously free existence, and cloud his quondam happiness. When, therefore, you detect an old inoffensive mitral scar, as evidenced by the mere hearing of a mitral systolic murmur, beware!

Subacute bacterial endocarditis engrafted on an old mitral valvulitis, usually occurs in youth and tends to lead its victim in a downward progressive course to the grave in spite of treatment. Fortunately this involvement is relatively rare when we consider all the existing rheumatic heart afflictions. Occasionally this process arises on an old scarred valve late in life, and determines the final exitus of the cardiac cripple.

The toxic type of heart disease occurring in youth or middle age is exemplified by hyperthyroidism and should not need much discussion for

those of us who live in the Great Lakes Basin where goiter is so prevalent. A rapid heart, moist skin, obvious nervousness without signs of congestive heart failure and no slowing response to digitalis (which is so frequently tried) should make us suspicious of goiter. It should also be remembered that occasionally auricular fibrillation ushers in the onset of hyperthyroidism.

We must not forget the possible effect on the heart, in middle and later life, of long standing adenomata of the thyroid which may manifest their effects in two ways: (1) by acceleration of the heart rate through their toxic action without signs of congestive heart failure; (2) by mechanical pressure from the enlarged gland, often substernal, which may impinge on the phrenic nerves and produce intermittent or continuous pains in the precordium simulating the anginal syndrome.

The toxic adenomata should be removed, of course, and the substernal thyroids should be removed because of their mechanical embarrassing effects to the circulation. There is a third type of adenomatous thyroid that is seen in the sixth and seventh decades where, in spite of normal metabolisms, there seems to be toxic effects on the heart and circulation, and these also should be removed. No matter what the age of the patient, toxic and mechanically obstructive thyroids should be removed. Surgical removal of such thyroid glands will, provided the toxic damage has not existed too long, bring about rehabilitation of the patient, restore his cardiac efficiency, and cause a disappearance of the precordial pains.

We now come to that middle aged group possibly carrying in their hearts an old scar on the mitral valve from some infection acquired in youth but long since healed. Such individuals may have lived an active useful life unaware of this scar on the valve and unhandicapped by its presence. They are now in the age zone where insidious degenerative changes may be taking place in the heart as well as in the body generally: where increased deposit of abdominal fat may result in dyspnea on exertion; where years of sedentary life may have reduced the general muscular tone, so that moderate unusual exertion may induce palpitation of the heart, where smouldering arthritis in the spine may send radiating pains around the precordium; where the blood pressure level may be raised to a constantly

higher plane or may show intermittent periods of slight or sharp elevation with intervals of return to normal; where the individual himself is aware of the number of years he has lived, and so, when his friends begin to drop off around him, becomes increasingly apprehensive with each succeeding birthday.

The nervous system in such individuals for years bombarded by the stress and strain and worry of business may, in the fifth and sixth decades, begin to show signs of the wear and tear of life, as manifested by a lowered threshold to stimuli, and thus the individual becomes increasingly aware of previously unnoticed somatic sensations.

Likewise, the woman in the menopause experiences a slowing down in vitality, acquires an increased deposit of abdominal fat, and is subject to rises in blood pressure with the result that she may be disturbed by symptoms referable to the heart and circulatory system.

Because of all of the above factors, there is no place in the field of cardiology that requires greater skill and judgment in differentiating between functional disturbances and organic changes in the heart nor wisdom in guiding the patient.

We still have to deal with that final questionable class which the pathologists deride and the clinicians abhor, namely, those slender ashenic individuals with sensitive nervous systems, unduly conscious of their hearts. Da Costa first described these individuals during the Civil War, and they were reinvestigated in the Great War, and classified as "Irritable Hearts" or D. A. H. (disordered action of the heart). Since Da Costa's time we have been accustomed to deal with this syndrome in private practice but not in such numbers nor with such severe symptoms as the emotional and mental stress of trench warfare produced.

Quite an extensive study of these types resulted in three conclusions: (1) that generally these hearts were fundamentally sound and that the syndrome usually arose in slightly built individuals of a sensitive nervous system; (2) that rest, digitalis, and a diagnosis of heart disease did not quiet these fast beating hearts, but rather tended to aggravate and prolong the condition; (3) that sedatives and graduated exercise (notably walking) restored over 60 per cent to normalcy; (4) that the finding of a systolic murmur over

the apex need not alter the treatment nor affect the recovery, the murmur probably having existed previously, without cardiac embarrassment. So impressed were the British Commission, who studied this problem, with the unwisdom of referring to these cases as heart disease, that they designated them merely as D. A. H.

And now may I submit a few histories of cases illustrating some of the pitfalls of cardiac diagnosis thus far expressed?

*Case 1.*—M. W., aged twenty-nine, a saleswoman, came to my office May 24, 1927, with the story that she had been in her usual health up to January, 1927, when she had an attack of erythema nodosum and stiff knees. She was in bed four weeks with a fever ranging between 101 and 102, and profuse sweats, and the attending physician found a valvular insufficiency and prescribed "drops" for the heart. Since February, she had been mildly ambulatory, but never free from sensations referable to the heart. Her complaint at that time was palpitation of the heart on the least exertion, nervousness, occasional periods of diarrhea, but a very good appetite though this had not resulted in any gain in body weight. In addition she noted a sense of general body warmth, even warm hands and feet. She stated that she was slightly short of breath on exertion and had some slight swelling of the ankles.

As to her previous illnesses, she had had scarlet fever at the age of one year, and this had been followed by a tonsillectomy. She had had measles at the age of five, but no other illnesses.

The findings of note on physical examination were: a moderate sized, bright eyed listless individual whose skin was rather pink and flushed, whose hands showed moist warm palms, and a fine tremor of the fingers. The eyes were slightly prominent, the pupils were equal, circular, and reacted to light and accommodation. The tonsils had been cleanly removed, and the thyroid showed a two plus enlargement.

The heart showed no gross enlargement, the borders to percussion being 4.0 cm. right and 12.0 cm. left. A slamming apical first tone with a presystolic murmur was heard over the apex, and a musical note heard over the mid-precordium which increased on inspiration and diminished on expiration. This raised the question of a pericardial friction rub.

The heart rate was 128, and the rhythm regular. The blood pressure was 140 systolic and 70 diastolic. Examination of the abdomen revealed the liver not enlarged, and the spleen not palpable. The extremities showed no edema of the shins, and the knee jerks were present and equal. Her average weight was 105, and her present weight 98 pounds.

The patient entered the hospital June 6, 1927, where the records revealed a basal metabolic rate of plus 28 per cent, hemoglobin 83 per cent, erythrocytes 4,800,000, leukocytes 5,700, P.M.N.'s 56, lymphocytes 41 per cent, eosinophiles 3 per cent.

After a week's rest in bed on Lugol's solution and

sedatives, the patient began to run a fever, and the murmur over the apex became louder and harsher, and the metabolic rate rose to plus 46 per cent. The fever continued to run between 100 and 101 F. The leukocyte count did not go above 9,000. This state of affairs persisted for a month, and in spite of absolute bed rest and treatment, the patient seemed to be growing worse. It was of course, obvious that we were dealing with a toxic type of hyperthyroidism, but it seemed probable that we had an associated endocarditis. The fever seemed to be too high to be produced by the hyperthyroidism, so I concluded that it must be coming from a fresh endocarditis. What was I to do? Certainly, the hyperthyroidism was breaking down the patient's resistance, and aggravating the heart condition, and of course this should be checked, but what would a thyroidectomy do to this endocarditis? If the thyroidectomy were not done the patient would surely die, and if the thyroid was removed she might die from the shock and acceleration of her endocarditis. One would be death by omission, and the other death by commission. I chose to take the active course and on June 21, 1927, she submitted to a subtotal thyroidectomy. Following the operation, the patient's pulse rose to 160, but remained regular and her temperature went to 102.5 F., but gradually subsided within a week to normal. During this period, she had a definite psychosis, but at the end of ten days her heart was quiet, the fever gone, the mind clear, and she left the hospital at the end of six weeks with a pulse of 80, normal temperature, and no signs of fresh endocarditis. Three months later, she showed a complete recovery, heart rate of 72, rhythm regular, and the musical note in the fourth interspace had lost its character of a pericardial friction rub, and was more the murmur of a buttonhole mitral stenosis.

In June, 1932, five years after her thyroidectomy, she reported to the office for some minor condition, and stated that she had been well and active during the past five years. Her weight was 115 pounds, hemoglobin 80 per cent, erythrocytes 4,300,000, leukocytes 8,200, blood pressure 110 systolic, 70 diastolic, and on auscultation she showed signs of a pure compensated mitral stenosis.

*Case 2.*—Mrs. L. M. F., a sixty-six year old housewife, came to my office in April, 1931, stating that, up to eighteen months before, she had been quite well, reasonably strong, and had done her own housework without undue fatigue. About this time, she began to notice pains over the heart, behind the left shoulder blade, and down the left arm. These pains were first noticed while in bed at night, and would last several hours. Three weeks prior to her first visit to the office, she was awakened out of a sound sleep with an awful feeling as though death were approaching. She said, "I felt no pain, but this feeling of horror outweighed all other sensations." The physician who was called at the time, diagnosed the condition as angina pectoris. The patient was kept in bed four days. Since that time, the pains have been more frequent and more severe.

She stated that she had a gallbladder operation for removal of stones in 1918, and had all infected teeth removed fifteen years ago. She had had no dropsy and no dyspnea. Her average weight had been 120; present 111 pounds.

The findings of note in the physical examination



Fig. 1

were a two plus firm adenomatous enlargement of the thyroid which was definitely substernal, and could not be raised out of the sternal notch. She had a normal sized heart with a rate of 96, regular rhythm, clear tones, and no murmurs. Her blood pressure was 150 systolic and 90 diastolic; hemoglobin 65 per cent, erythrocytes 3,860,000, leukocytes 5,650, basal metabolic rate of plus 6 per cent.

X-ray of the chest (Fig. 1) revealed a small centrally placed heart, total transverse diameter of 10.6 c.m. and a substernal shadow continuous with the thyroid which extended down to the arch of the aorta. The electrocardiogram showed a low "T" wave in leads one and two, and a flattened "T" wave in lead three, but no evidence of coronary occlusion. I believed that her pains were due to mechanical pressure from a substernal thyroid, and not due to angina pectoris.

She refused a thyroidectomy, continued to lose weight, to run a heart rate around 90, and to have a mild general trembling of her whole body, a sense of suffocation, definite dyspnea on exertion, and occasional attacks of precordial pain. After three months, when she had lost a total of nineteen pounds, she consented to a thyroidectomy, which was performed on July 24, 1931. The second post-operative day, she developed auricular fibrillation which was readily controlled by quinidine. Beyond this, she made a smooth post-operative recovery, and left the hospital on the eighteenth day.

One year later, her weight had risen to 119 pounds, a gain of 28 pounds. She was leading a normal life with occasional attacks of pain in the precordium, not

characteristic of angina pectoris. Her heart rate was 72, and her blood pressure was 160 systolic and 90 diastolic. Apparently, in this case, we had a degree of thyroid toxemia not revealed by the low metabolic rate, and I believe this case illustrates very nicely the dictum that a toxic thyroid should be removed, no matter at what age.

*Case 3.*—Mrs. E. L. S., a widow, aged forty-seven, presented herself at my office on February 22, 1931, stating that for several months she had been subject to attacks of pain across the chest coming on at night, arousing her from sleep, lasting an hour or more, and passing off spontaneously. In addition she complained of pain in the left shoulder and the inner side of the upper left arm and axilla. These arm pains appeared either during the day or at night, and either while quiet or undergoing exertion. She further stated that she was very nervous and was a fitful, restless sleeper, and finally she stated that she had been told by another physician that these pains were due to angina pectoris and that she had had ambulatory treatment for this condition without relief.

As to her previous history, she was the mother of two children, aged twenty and twenty-three respectively. Her husband had died rather suddenly two years before under conditions that seemed to have a direct bearing on her present problem. She stated that while driving with her husband in his auto, he suddenly experienced an agonizing pain in the left arm, and asked his wife to take the wheel. The pain increased in intensity, gradually radiating onto the left chest. He reached home shortly after the onset of the pain, and the physician, who arrived about the time the patient expired, diagnosed the cause of death as angina pectoris. Naturally, when the widow was told two years later that the pains of which she was complaining were due to angina pectoris, she would recall her husband's death and expect she was approaching a similar fate. This situation was further aggravated because of turmoil in the family in which she was acting as a buffer between her two children and trouble. It was doubly important, therefore, to eliminate this fear, which could only be accomplished by a thorough examination, and the finding of proof for or against the diagnosis of angina pectoris.

She had submitted to a hysterectomy for bleeding fibroids five years previously, and also to an appendectomy at the same time, and had not menstruated since. She drank six to eight cups of coffee a day, took no exercise, and her weight had risen from 160 pounds to 180 pounds during the past three years.

The findings of note on examination were that she was markedly overweight, had a slight thyroid enlargement, and a heart moderately enlarged to the left, with a rate of 96, regular rhythm, slightly indefinite apical first tone, but no murmurs. There was a moderate accentuation of the aortic second tone, but no signs of congestive failure, and no edema of the shins. The urine was negative, hemoglobin 76, erythrocytes 4,050,000, blood pressure systolic 184, diastolic 84. X-ray of



the heart (Fig. 2) showed MR 3.9 cm., ML 10.5 cm., a total transverse diameter of 14.4 cm., which was 50 per cent of the internal chest diameter. The electrocardiogram (Fig. 3) showed a normal sinus rhythm, auricular and ventricular rates being equal at 66 beats per minute. There was a PR interval of .16, R .08, and

pressure 146 and diastolic 90, heart rate 72, action quiet, easy, and no murmurs.

*Discussion.*—While in this case, the absence of the so-called coronary T wave in the electrocardiogram does not preclude the existence of angina pectoris, yet its absence would certainly demand the presence of the

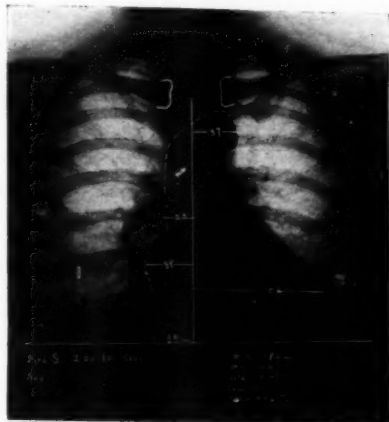


Fig. 2

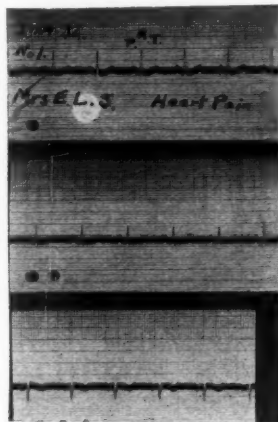


Fig. 3

the T wave low in all leads, but showed no crescentic downward deflexion, characteristic of a coronary T wave. A left ventricular preponderance was present.

The blood chemistry was normal, Wassermann negative, first basal metabolic rate was plus 16, and the second, some days later, was a minus 11 per cent. The patient showed a normal capacity both to dilute and concentrate urine.

After securing these findings, I told the patient definitely that I believed she did not have angina pectoris, that her pain was not the right type nor in the right location to be classified as angina, advised her to stay in the hospital and have her overwrought nervous system dealt with and at the same time secure a much needed weight reduction. With a preliminary two weeks absolute bed rest, simple sedatives, 1,000 calory diet, and general daily massage, her insomnia was controlled by the tenth day, and the pains in the left chest and arm disappeared, and the blood pressure dropped to 130 systolic and 84 diastolic.

At the end of six weeks her weight was reduced to 162 pounds, and the blood pressure was 125 systolic and 75 diastolic. She was able to walk six blocks daily without pain. She left the hospital at the end of eight weeks, during the last two of which she was taking no medicine of any sort, walking daily between twenty and thirty blocks without pain and sleeping soundly all night.

Six months later, she reported at the office stating that she had continued to feel well, to be free from pain, was walking two miles a day, and sleeping well. Her weight remained at 162 pounds, systolic blood

pressure 146 and diastolic 90, heart rate 72, action quiet, easy, and no murmurs.

other cardinal signs and symptoms and the persistence of the syndrome, in order to justify the diagnosis of angina pectoris; lacking these, the diagnosis must be discarded. We can classify the pain in this case as a myocardial fatigue pain which frequently occurs in women while under stress and strain, and during states of nervous irritability such as occur during the menopause.

Seemingly too in this case, the increase in body weight with the resulting higher left diaphragm was an additional aggravating factor. Doubtless, too, the association in her own mind of her condition and her husband's death, kept her in a state of fear which increased her insomnia and helped to keep her blood pressure raised. Two years later there had been no return of the precordial pain.

*Case 4.*—Mrs. J. E. F., aged forty, housewife, presented herself at my office on October 14, 1931, desiring an opinion as to her heart, which she stated beat wildly from time to time and that, in addition, she was troubled with insomnia, and was very nervous.

She stated that she had had this trouble off and on for many years, that it began sixteen years ago when on account of obesity, following the birth of her first and only child, she took (on her own initiative) 30 grains of thyroid extract (P. D. & Co.) a day for three months, with a resultant weight loss from 179 pounds to 129 pounds, severe palpitation of the heart, nervousness, and general debility. She was so ill following this experience that she was forced to be under a doctor's care for three months.



It seemed, from her story, that there might have been some hypothyroidism following her pregnancy, for she stated that she was sleepy day and night, very sensitive to external cold, liked the temperature of the house 80 degrees, and that her weight before her pregnancy

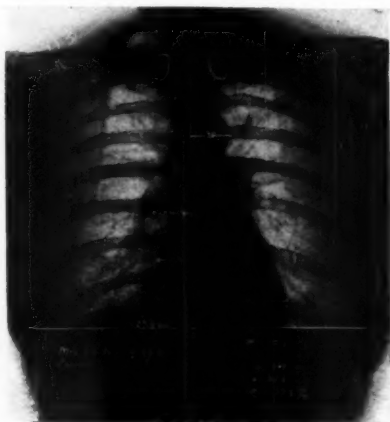


Fig. 4

was 135 pounds and after 165 pounds, but of course the dose of thyroid extract was too large.

Seven years later, her weight having gradually risen to 179 pounds, she repeated the thyroid treatment. Her weight promptly dropped to 130 pounds, and she had another illness in bed with a fast heart but eventual recovery. Since that time, she had been subject to palpitation of the heart either on exertion or while at rest. Swimming, walking, stair climbing, etc., produced acceleration of the heart rate.

As a child she was well and quite active and had no heart symptoms until this first experience of taking thyroid extract sixteen years ago. She was operated upon for a tubal pregnancy fourteen years before, and five years ago had had her appendix and a right ovarian cyst removed. She had the "Flu" in 1929 with a dragging convalescence, and before she could completely recover, she had to have a tonsillectomy. Four years ago, she was operated upon for gallstones, and during the post-operative period her heart beat so rapidly that an internist was called in consultation and prescribed digitalis without much quieting effect on the heart.

A year later, she was examined at a neighboring clinic and told that the cardiogram and x-ray revealed no evidence of any organic heart disease. Bromide was prescribed and her heart remained quiet for eight months, but eighteen months ago she had discovered a domestic triangle and since that time she has suffered from nervousness, palpitation of the heart, and insomnia.

The physical examination revealed a healthy appearing woman with no signs of dyspnea, or cyanosis. Her

weight was 143 pounds. The heart percussed out R 3.0 cm., and L 6.5 cm.; the rate was 72, rhythm regular, apical tones clear cut and strong, and no murmurs heard. Her blood pressure was 112 systolic and 74 diastolic. The abdomen was normal except for a right rectus scar. Rectal examination revealed internal and external hemorrhoids, and a fissure.

X-ray of the chest (Fig. 4), showed a small, narrow, centrally placed type of heart, normal in outline with a total transverse diameter of 11.2 cm. The electrocardiogram showed a normal sinus rhythm with a ventricular rate of 75, a PR interval of .18, R of .06, RT of .38 and the T wave upright in all leads. The hemoglobin was 83 per cent, erythrocytes 4,430,000, leukocytes 6,500.

*Discussion.*—It was obvious that this patient was suffering from a typical irritable heart and equally obvious that the heart itself was fundamentally sound. Her difficulty arose from the fact that she feared that in one of these attacks of palpitation she might die suddenly and thus leave her nineteen year old boy without any guidance in the world. It was further obvious that she believed her painful rectal condition to be the beginning of a cancer and she seemed to be quite sure that if she did not die from the heart condition the cancer would cause her death. I assured her, as a result of her history, clinical examination, and laboratory findings, that her heart was fundamentally sound, that I believed also that the rectal condition was a simple thing. Since her heart would withstand an anesthetic the proper procedure was to have the rectal condition explored under an anesthesia and properly treated.

Relieved from the worry about her heart, she readily consented to have the surgical investigation of the rectum, which proved to be merely a fissure and external and internal hemorrhoids. These were dealt with and in her convalescence she was delighted to know that she need have no cause for worry from that source.

She was kept on simple sedatives to quiet her irritable nervous system and was encouraged to get about very soon. Relieved from the fear of heart disease, she took up walking again, which she had abandoned because she feared it might aggravate her heart condition, and the walking and the sedatives served to keep her heart quiet and restore her confidence in herself. In spite of the fact that the strain of the domestic situation increased, her heart remained quiet, and she was able to sleep well, and had no attacks of palpitation. A year later, she was still well.

*Case 5.*—Russell O., aged 34, a machine shop worker, came to my office May 27, 1932, complaining of heart attacks which began while in college eleven years before. The first attack came on following a tusseling match with another boy. During this exertion, he became winded and his heart beat fast, though this did not alarm him at the time, but that evening on preparing for bed, his heart beat fast, and very hard, when he laid down. This fast beating came on gradually, and lasted about thirty minutes, and disappeared

gradually. A nearby physician who was called gave him a hypodermic injection and he finally went to sleep. The following day, he felt worried and tired and had a similar attack that night which required another hypodermic injection.

Believing that this condition was a serious heart condition, he went to a hospital in Fort Wayne, and was under observation for five days without any heart attacks, and no signs of heart disease were found, so he returned to school and experienced a similar attack when he went to bed that night. This convinced him that his heart was bad in spite of the negative reports at the hospital, so he gave up college and went home, where he has been most of the time since, working in a machine shop a few days at a time and quitting because of these heart attacks.

He stated that it was hard for him to sit still and read at night because his heart pounded, that he could not go to the movies because his heart pounded and made him nervous and that it took him one or two hours to get to sleep at night, because of this heart pounding. He recalls no other previous illnesses.

Interestingly enough, he was with the American Army on the Mexican Border in 1916, and overseas with the American Expeditionary Force in France for three months during the Great War, and stated that all this time he felt well, hiking and doing all the things that anyone else did.

He is an only child, and his mother is a neurotic who has been under a neurologist's care for a number of years. His father was a phlegmatic Scandinavian, and died three years ago as a result of an endocarditis on an old valve lesion. The patient was examined by his mother's physician in 1921, and told that the condition was of nervous origin, and sedatives were prescribed without effect. He submitted to a tonsillectomy in 1919. *He has used a box a day of Copenhagen snuff since the age of twelve years.*

Physical examination revealed a tall, well nourished, healthy appearing adult who stuttered as he talked and whose movements were quick and active. The pupils were equal, circular, and reacted to light and accommodation, but while the pupillary contraction came on quickly, it was not well sustained; a reaction suggestive of an unstable neuromuscular control. The teeth showed many crowns, had been x-rayed and were said to be sound. The gums were firm and free from infection. The tonsils showed complete removal. The thyroid was of normal size, and elastic in consistency. The lungs were resonant throughout and revealed no abnormal sounds.

The heart showed no visible or palpable apical impulse. The percussion outline depicted a narrow centrally placed type of heart, with a varying rate between 81 and 84 per minute. The rhythm was slightly uneven, characteristic of sinus arrhythmia. On auscultation there was a short clear cut apical first tone but no murmurs, a reduplication of the pulmonic second but no other abnormal sounds. The abdomen was negative, the extremities showed no edema, and the knee jerks were present and equal. The urine was nega-

tive, the hemoglobin 85, erythrocytes 4,500,000, blood pressure 150 systolic and 90 diastolic.

He was hospitalized for four days' observation. The x-ray of the heart (Fig. 5) showed a long narrow centrally placed type of heart with a total transverse diam-

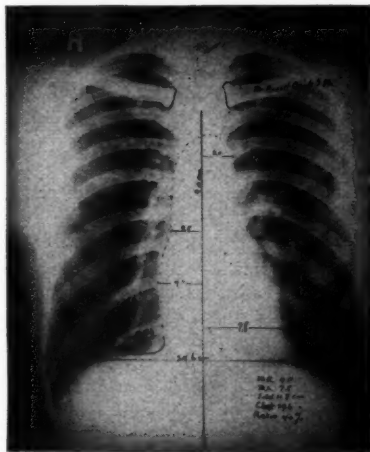


Fig. 5

eter of 12.2 c.m. which was 42.3 per cent of the internal chest diameter. The cardiogram showed a normal sinus rhythm, rate 72, PR interval of 0.18 seconds R of .06, RT of .33, and the T wave upright in all leads, a good looking cardiogram. The basal metabolic rate was minus 11 per cent, pulse during the test 76 to 74, and respiration 15. His blood pressure reading was systolic 120, and diastolic 80. The blood calcium showed 10.5 mgms.

**Discussion.**—It seemed that as a result of the clinical history, x-ray findings, and cardiographic records, that we were dealing with a heart that was fundamentally sound but over-acting, in other words, a typical irritable heart; but since it had not responded to sedatives and psychological handling in the past, we had to assume an additional factor of toxemia, and it seemed probable that this might come from continuous use of snuff. The patient was impressed with the deleterious effect of snuff, which was discontinued, and by the use of heavy doses of sedatives to quiet the nervous system and secure profound sleep at night, his heart became quiet and remained so, and thus we were gradually able to drive from his mind the old fear complex in regard to his heart, and substitute a state of confidence and calm. He quickly became rehabilitated and was soon able to walk two miles a day and climb hills without attacks of palpitation, and without any difficulty in going to sleep at night.

**Case 6.**—Laura U., aged 20, no occupation, presented herself at my office September 24, 1929, stating that she had been suffering from heart disease since 1924.

In the fall of 1924, she had had an attack of the so-called "intestinal flu" followed by an attack of chorea lasting five months, which was succeeded by a second attack of intestinal flu. During this latter illness, the family physician told her that she had heart trouble,

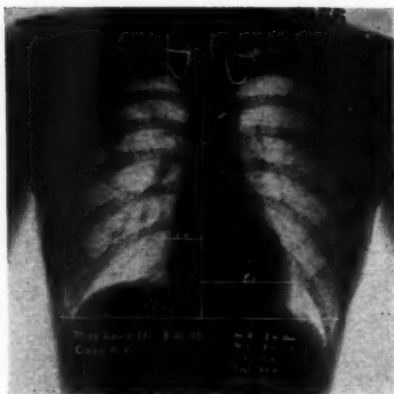


Fig. 6

and that she must live a careful life. She states that at that time she felt weak and run down and dragged about the house, and that she would be subject to attacks of pain in the heart when in bed at night, and at such times her heart would pound and beat fast.

She continued to lead a semi-invalid life and in the spring of 1929 she developed mumps and was in bed ten days. The first day she got out of bed, she had a fainting spell which frightened her and left her feeling quite weak so that she began to worry about her heart. In May, 1929, a physician was called, who put the patient to bed for six weeks, and told her that her heart was very bad, and gave her "green tablets" until she vomited. Following this experience she was allowed to get up gradually but was not able to do more than move about the house.

To summarize the above story briefly, she had been an invalid and confined to the house and premises for the past five years on account of this heart condition, and was complaining of weakness, nervousness, and apprehension, and her family were as solicitous about her as she was worried.

As far as her previous history prior to her present complaint is concerned she was well and strong up to the age of fifteen years, and worked with her father in the fields. At the age of ten she had had a severe tonsillitis and had had a tonsillectomy. Her weight was 110 pounds. Menstruation had begun at the age of fourteen and has been irregular. There had been no menstruation for the past three months.

The physical examination revealed a tall, fairly well nourished, poorly developed young woman who appeared calm and was slow and deliberate in speech and apparently slow in thought, but at the same time ap-

peared very emotional and nervous. She had a mottled port wine discoloration of the hands and arms extending almost to the axillæ, and her hands were cold and clammy to touch. She had a very bad posture. She stood slumped over with the shoulders forward and the abdomen caved in, and sat in a similar position so that she had very little use of her diaphragm as an aid to return venous circulation.

The pupils were equal, circular, and reacted well to light and accommodation; teeth were sound; tonsils were absent; thyroid showed a moderate sized gland which was smooth and elastic; lungs were resonant throughout and there were no abnormal breath sounds. The heart showed an apex beat both visible and palpable through a thin walled chest just inside the nipple line and a systolic shock was felt over the apex. The right heart border was percussed 3 cm. and the left border 7 cm. from the midline. The heart rate was 100 beats per minute and the rhythm was of the sinus arrhythmia type. There was an audible slightly harsh systolic murmur over the apex, transmitted but a short distance towards the axilla. There was no accentuation of either the pulmonic second tone nor the aortic second tone. The blood pressure readings were systolic 120 mm. diastolic 80 mm.

The liver was not enlarged and there were no abnormal findings in the abdomen. The extremities showed flabby leg muscles, no edema of the shins and normal reflexes. The urine was negative; the hemoglobin 80 per cent, erythrocytes 4,500,000, leukocytes 8,300 and the Wassermann was negative.

She was observed in the hospital for a period of two weeks, where a normal sized heart was revealed by the x-ray (Fig. 6) and a normal cardiogram was also obtained, but interestingly enough the metabolic rate was minus 20 per cent. She was told that she had no signs of active heart disease, that her symptoms were due to an irritable heart, that inactivity and worry aggravated this irritability, and that what she needed was graduated exercise to strengthen her heart and keep it beating steadily, that her feeling of weakness was probably due to the low thyroid function, and should be relieved by the taking of desiccated thyroid gland.

During her stay in the hospital away from her oversolicitous family, she greatly improved and was sent home on bromide and thyroid gland, and instructed in calisthenic exercises to improve the posture and increase the use of her diaphragm. On this regime, she was able to walk out of doors, and by the end of two and a half months from the time of her first visit she had gained ten pounds in weight and was walking three miles a day, and helping with the housework. By February 1, 1930, four months after her first visit, she was walking five miles a day, and the port wine mottling of both arms and hands had completely disappeared, and she had gained an additional three pounds, all of which had been achieved by exercise and desiccated thyroid gland. Her blood pressure was 116 systolic and 64 diastolic, and the heart rate was 72 beats per minute. The apical systolic murmur was less harsh than at the first examination, and in addition there could be heard, when light pressure of the stetho-

scope was used, a slight "click" as though from an old healed spot of pericarditis.

Eighteen months after her first visit, she reported again at my office stating that she felt in perfect health and that for the past year she had been successfully doing the cooking and part of the housework for a family of four persons. Her weight at this time was 136 pounds, a total gain of 26 pounds, and her heart's action was quiet and efficient with an even rhythm and a rate of 60 beats per minute. She had been taking regularly a grain and a half of desiccated thyroid daily. Her basal metabolic rate was minus 16 per cent, but as long as she felt well it seemed unnecessary to increase the dose of thyroid, and she was advised to continue to take this amount daily.

*Discussion.*—A previously healthy adolescent girl suffered from a series of systemic infections for a number of months. During the course of these illnesses a mitral valvulitis with some myocardial insufficiency was detected by the family physician and the patient was informed that she had "heart trouble," and was advised to lead a careful life.

No constructive rehabilitation regime had been instituted and the patient had not been told that the majority of such patients recover satisfactorily and that she need not anticipate sudden death as the result of this heart involvement. She was left to flounder along as best she could, full of worry and apprehension and attributing her sense of weakness to her "heart trouble."

Naturally when later she suffered a simple syncope while convalescing from a mild intercurrent infection, her fears increased and she was then sure that the heart was growing worse. When the second physician entered the scene he found that the heart was overacting from the *fear drive* and, hearing a loud systolic murmur intensified by the rapid heart and listening to the recital of her past heart woes, was impressed with the seriousness of the situation and prescribed bed rest and digitalis, a regime effective if there existed congestive heart failure associated with an old mitral valvulitis, but ineffective when the fast rate was due to an irritable heart and the murmur due to an old healed non-crippling scar on the mitral valve.

The real underlying cause of the patient's weakness and incapacity was an unrecognized non-myxedematous hypothyroidism, probably originating at the time of her series of systemic infections which produced a smoldering infection in the thyroid, as well as in the heart, resulting in a decrease of thyroid capacity; but whereas the scar on the heart was easily recognized, the subfunction of the thyroid was overlooked and the patient subjected to five years invalidism and worry.

Her quick response to thyroid therapy and graduated exercise bears witness to the belief that the infection in the heart was a burned out quiescent condition and not at that time producing her symptoms.

*Addenda.*—This patient was seen in April, 1933, two years after her last visit. She has been married, has gone successfully through a pregnancy and labor and now has an eight months old baby, and has had no return of her former symptoms.

#### CONCLUSION

In conclusion, let me restate the following deductions.

First, that while the present day scientific approach to cardiology has greatly enhanced our knowledge and enabled us to make more exact diagnoses, yet it has not enabled us to abandon all the previously accumulated experience concerning heart disease.

Second, that the mere finding of grave structural changes in the heart, as revealed by clinical examination, x-ray, and the cardiogram, does not tell us whether this heart can carry on and how long it can carry on. This knowledge must still be determined by the clinical evidence of the heart's functional capacity.

Third, that the finding of a slight scar on a heart valve (evidence of a previously healed non-crippling valvulitis) does not of itself justify us in alarming the patient by diagnosing "heart disease" nor demand treatment unless congestive heart failure is likewise present.

Fourth, that rest and digitalis are not the panacea for every casually detected heart murmur or fast pulse.

Fifth, that it is not by means of altered cardiographic curves or changed x-ray outlines that we can always foretell the patients cardiac future.

In the final analysis we must estimate the heart's functional capacity to carry on, and on this, advise the patient and plan the treatment. Only wisdom, experience, and a study of each individual patient can accomplish this goal.



## DISTINCTION OF THE NORMAL FROM THE DISEASED HEART\*

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IT is frequently difficult to distinguish the normal heart from one that has been slightly injured by disease. It is likewise difficult always clearly to distinguish the slightly injured heart from the structurally normal heart that is disturbed by the augmentative influences of neurosis. Furthermore, derangement of remote components of the body may disturb the action of the heart to such a degree that false indictment of this organ is possible.

It is obvious that institution of proper treatment, and formulation of a relatively accurate prognosis, is impossible unless the diagnosis is correct. There is probably no branch of medicine in which it is more important to decide definitely when disease is absent and apprehension without cause. The error of judging an impaired heart as normal is not greater than judging a normal heart as impaired. The consequences in both instances may be very unfortunate.

The responsibility of rendering the opinion that a heart is normal cannot be avoided on the basis that the diagnosis may not be correct, and the risk of being wrong does not justify an attitude of protective contentment or of diagnosing heart disease on mere suspicion. Neither is it permissible to accept a diagnosis of disease made by someone else without confirmation, for the diagnosis of heart disease may be erroneous.

The necessity for diagnostic accuracy is greater today than ever before, owing to the actual increase in the incidence of heart disease. The public mind is well aware of the fact that heart disease at this time is the individual leading cause of death in this country and it is not difficult for some persons to misinterpret symptoms and to conjure apprehension which can be allayed only by an attitude of reassurance on the part of the medical examiner. It is obvious that the physician cannot be of genuine service to his patient unless he, himself, is assured of the correctness of his diagnosis.

One is never justified in using vague or inappropriate terms in discussing the results of examination with the patient. To advise the patient

that he has a "weak heart" or that the heart has been "strained" is the physician's admission of his own ignorance. When heart disease is present, the nature of the disease should be explained to the patient in language that he understands, so that exaggerations shall not occur and sow the seeds of despair. Not infrequently, patients with cardiac neurosis are told they have "heart trouble" and that the "heart is weak," thereby convincing unfortunate sufferers that the future holds only dissolution, and each day of horror adds to their already useless invalidism.

### ETIOLOGY

A critical inquiry concerning primarily etiologic diseases and intelligent interpretation of the results of this inquiry is of paramount importance in every case in which distinction between the presence of a diseased or of a normal heart is to be made. Fortunately, the list of etiologic diseases has dwindled with the passage of time, to some extent simplifying a hitherto pretentious array of medical terms. It is interesting to compare the chapters devoted to etiology in the older textbooks with the corresponding paragraphs of modern works. Such diseases as scarlet fever, influenza, measles, and typhoid fever no longer are considered to be certainly etiologic, as they were thirty years ago.

Of all the infectious diseases, rheumatic fever, chorea, and syphilis are considered of primary etiologic significance today. The ever increasing amount of material obtained at necropsy, and its critical correlation with symptoms and physical signs, has strongly fortified the position of the foregoing infectious triology, and has to a large extent shattered the assumed position of more or less speculative factors.

Rheumatic fever and its mysterious ally, chorea, continue to hold their frightful superiority in the production of heart disease among children and young adults. The incidence of carditis is so great following these diseases that their previous occurrence places the burden of responsibility directly on the physician to offer convincing evidence that the organ has miraculously escaped. The detection of mitral stenosis or aor-

\*From the Section on Cardiology, The Mayo Clinic, Rochester, Minnesota. Read before the Oklahoma Clinical Society, Oklahoma City, October 31 to November 3, 1932.



- tic insufficiency in examination of a young person is virtually positive evidence of previous rheumatic fever or its nonarticular counterpart. It is interesting to note that cardiac involvement usually occurs with the first attack of rheumatic fever, although recurrent exacerbations unquestionably contribute to the already existent injury. Rheumatic fever, affecting a patient who has hitherto escaped, is unusual after the thirty-fifth year of life, although recurrent episodes, even late in life, are not exceptional. Thus, elicitation of a history of rheumatic fever or chorea justly makes the physician deliberate, utilize his acumen of diagnostic experience, and muster his accessory methods of detection before pronouncing the heart healthy.

In considering syphilis as etiologic of cardiovascular disorders one is, in reality, concerned with the late stages of the disease, for the subjective and objective evidence of circulatory impairment is chiefly evidenced in middle life. So far as the cardiovascular apparatus is concerned, syphilis acts in a subtle and often unrecognized manner, the havoc of its subtle attack often occurring many years after contraction of the disease, and often after memory of the indiscretion has been gratefully erased.

Modern teaching, however, does not permit one to rest content with consideration of syphilis only in its advanced stages, for ample proof has been presented that early treatment, carried out persistently, is effective in many cases in avoiding the visceral complications of a later day.

Syphilis has no regard for caste or rank, and its possible influence in the condition of persons who are in middle life and who present themselves owing to actual or suspected heart disease never can be denied until proved to the contrary. Occupation or intellectual attainment can no longer be employed to tilt the balance to the side of exoneration. Modern laboratory methods such as the Wassermann reaction and its modifications, examinations of the spinal fluid, and so forth, have done much to increase accuracy of diagnosis, yet there is always that appreciable group of cases in which these specific procedures yield negative results, and ultimately evidence of active disease appears.

The occurrence of aortic insufficiency in middle life is usually, but not always, suggestive evidence of syphilis. Thoracic aneurysm is of course practically irrevocable evidence of the dis-

ease. Previously, the occurrence of the anginal syndrome was frequently considered to be due to syphilis, whereas today it is realized that it is of rare occurrence and is almost limited to those cases of aortitis in which the coronary ostia are narrowed.

Little comment can justly be made regarding the actual etiology of the most important cardiac diseases which confront the physician today; namely, coronary disease and hypertensive heart disease. Their increasing incidence seems to be well established, as is also their tendency to progress when once well under way. The mechanical effects of these diseases on the heart and circulation are well understood, but the specific influences causal to their establishment are still enigmatic. The apparent parallelism of their increasing frequency with the increasing stresses and strains of modern American life, with its ever-increasing competition, financial calamities, and artificial standards of living, have to some extent, at least, been suspected of being etiologic influences.

In this connection, the part played by heredity cannot be dismissed, for only too often records are obtained relating to the occurrence of coronary disease and hypertensive heart disease in succeeding generations of the same family. Careful inquiry into illnesses and causes of death of previous generations often elicit invaluable information pertinent to the diagnosis of heart disease. Present-day records are woefully lacking in genealogic data, which in part is the result of failure to inquire, but to a large extent the result of the United States being a relatively young and enormously large nation. Our European ancestry has necessarily divided family trees, and the blending of nations and races has frequently obscured important knowledge regarding the past. Members of the average American family of today have little if any knowledge of their forebears before the third generation.

The presence of goiter should at once focus attention on the heart, although by no means is the heart always concerned. A thorough knowledge of disease of the thyroid gland, with the supplemental use of accurately conducted studies of basal metabolic rate, usually clearly separates the cases with hyperthyroidism from those in which goiter is inactive. Not infrequently, the patient with cardiac neurosis is made the victim of an unnecessary surgical procedure by the

erroneous diagnosis of hyperthyroidism. This shows an utter lack of understanding of both thyroid and cardiac disease. Exophthalmic goiter occurs when patients are less than forty years of age in 61 per cent of cases, whereas hyperfunctioning adenomatous goiter occurs after the fortieth year in 78 per cent of cases.

Congenital heart disease is usually not difficult to identify, although determination of the exact type of lesion is frequently impossible. The discovery of heart murmurs in infancy, and other striking signs in the absence of infectious etiologic disease, often adequately establishes the diagnosis. Among children and young adults the possibility of congenital cardiac disease must never be overlooked.

The tendency for certain forms of cardiac disease to occur predominantly among persons of certain age groups gives additional diagnostic aid when these occurrences are understood. In childhood and adolescence, the high incidence of rheumatic carditis and congenital disease would cause the physician to consider these possibilities first. In the age period from twenty to forty years, the suspicion of rheumatic carditis would still linger, but in addition to this the possibility of exophthalmic goiter, and, among older patients of this group, of syphilis, would be challenged. In the succeeding age groups, coronary and hypertensive heart disease would first be suspected, syphilis would not be overlooked, and hyperfunctioning adenomatous goiter would enter into the consideration.

#### SYMPTOMS

In writing on the symptoms that are produced by heart disease, I do so in the attempt to bring forth facts that will be helpful in determining when the heart is normal. The most constant, and therefore the most important, symptom of heart disease is dyspnea. It can be safely stated that unless dyspnea is present the cardiac lesion is of relatively little significance or has existed a relatively short time. Even in cases in which the anginal syndrome is present, dyspnea occurring with effort is frequently evident between the painful seizures. It is true that dyspnea may occur among obese persons, or among those who have neglected their physical training, and the physician must be alert in recognizing these vagaries. Not infrequently, patients complain of shortness of breath, when in reality they become

conscious of this normally automatic function and attempt to regulate it, thereby evoking the feeling of not being able to take a breath sufficiently deep to satisfy them. The series of successively deeper respirations is suddenly brought to an end by a yawn and then temporary relief for the patient is forthcoming. This is clearly a neurosis, and demands the same careful consideration that other functional complaints merit. Other causes of dyspnea unrelated to the heart will not be considered.

Cardiac pain is often one of the most significant clues to the establishment of the diagnosis of heart disease. In numerous instances this symptom is virtually the only condemning evidence. The characteristics of cardiac pain must be thoroughly understood, for it is admitted that all pains and painful sensations in the cardiac region are not the result of heart disease. Typical cardiac pain is paroxysmal, and usually is precipitated by influences that overburden the heart, such as exertion and excitement. The pain or oppression seems to be situated behind the sternum, or in close proximity, and typically radiates into one or both arms, although the areas of distribution are variable. The paroxysm is usually of short duration, disappearing as the heart responds to rest. One must not overlook those patients with the anginal syndrome who have pain when exertion is first undertaken, but who, when the initial pain subsides, are capable of enduring considerable additional and continued effort without experiencing further pain or discomfort. These circumstances frequently erroneously lead the physician to believe that the heart is healthy, and the patient, whose activities should be rigidly limited, is unwittingly permitted to pursue undertakings that are extremely hazardous to his existence. Similarly, the interpretation of pain resulting from intercostal myositis, herpes zoster, pleuritis, and so forth, as being due to cardiac disease, leads to an equally unfortunate situation, and many otherwise useful citizens are reduced to a state of chronic invalidism.

Palpitation is probably one of the most common cardiac symptoms that the physician is required to interpret. It is more often indicative of nervous disturbances than of disease of the heart. It may manifest itself as simple consciousness of the heart, or it may disturb the serenity of the patient in the guise of extrasystoles. Although extrasystoles occur when serious disease

of the heart exists, it is equally true that they occur as frequently when the heart is structurally normal. It is therefore important never to accept this arrhythmia as the sole criterion in establishing the diagnosis of heart disease. Patients with serious heart disease should not emphasize palpitation as their outstanding complaint.

Dizziness is frequently considered a symptom of heart disease. This is actually rarely the case, with the exception of its occurrence in cases of complete heart block, in some cases of paroxysmal tachycardia, and occasionally in cases of hypertension, especially when this is associated with sclerosis of the cerebral arteries. In general, dizziness should direct attention away from the heart, yet it is not infrequently the basis for the diagnosis of heart disease.

Similar comment is applicable regarding syncope as a symptom of heart disease. It is practically limited to the Stokes-Adams syndrome of heart block, and to cerebral anemia occasionally occurring in cases of paroxysmal tachycardia. The tendency of frail, nervous children to faint is frequently interpreted as indicating ominous disease of the heart, and unnecessary concern is evoked and restrictions imposed, when in reality the introduction of proper measures of hygiene would satisfactorily solve the problem.

It would seem almost irrelevant to make comment on edema as a symptom of heart disease, yet I feel justified in calling attention to certain pitfalls of diagnosis. No one would challenge the statement that dependent edema, enlargement of the liver, and dyspnea are the cardinal symptoms of congestive heart failure. However, all physicians are familiar with instances in which edema is confined to the feet, ankles, and lower parts of the legs, appearing during the day when the patient is up and about and disappearing after a night's rest; I have witnessed numerous instances in which this status obtained. On this evidence alone indictment of the heart has been made. Such cases are frequently examples of deep venous thrombosis and lymphedema, and the heart is in no way concerned with the serous infiltration.

It is therefore apparent that the symptoms of heart disease must be carefully evaluated, similar but not identical subjective phenomena at times falsely indicating impairment of the heart. It is again evident that caution is necessary in arriving at the opinion that the heart is healthy, yet

the importance of honestly rendering this opinion whenever evidence to the contrary is lacking cannot be denied.

#### PHYSICAL SIGNS

The recognition and evaluation of physical signs is one of the most important considerations in the diagnosis of heart disease, and in rendering the verdict that the heart is normal. The premise may be justly established that an enlarged heart is a diseased heart, and in so doing the physician obligates himself to be absolutely certain when he passes judgment that the heart is enlarged. Not infrequently medical examiners disagree on size of the heart of a given patient, and yet the validity of diagnosis may rest on this point. With the advent of roentgen rays, there has been a tendency to neglect the art of physical diagnosis, and acceptance of nonstandard roentgenograms has frequently resulted in deformed cardiac shadows that erroneously appear enlarged. It is now generally conceded that the teleroentgenogram gives the most accurate information regarding size and contour of the heart. This form of roentgenogram is a record, on film or plate, of the shadow of the heart and great vessels, cast by means of roentgen rays, with the tube sufficiently remote from the thoracic wall and the plate to minimize distortion to the least possible degree. The usual distance is 6 to 7 feet. The art of cardiac palpation and percussion should be highly developed by all clinicians, in spite of the fact that roentgen rays are available to them; in the majority of cases the size of the heart, as determined by palpation and percussion, should not vary more than 1 cm. from that recorded by the teleroentgenogram. In the interpretation of the cardiac contour and its size, numerous factors concerning the individual patient must be taken into consideration. The size of the normal heart varies according to age, sex, weight, height, and the build of the patient. Failure to recognize these variables necessarily leads to diagnostic error.

In the majority of cases of well established heart disease, enlargement of the heart is so obvious that no difficulty is experienced in determining the fact, but in the early case of cardiac impairment, and in the case in which impairment is only suspected, the necessity for accuracy and convincing evidence is of paramount importance.

In the appraisal of the healthy heart important information is gleaned by careful study of the heart sounds. The clinician must be well aware of the normal heart sounds and their physiologic alterations. Tones that are distant, or that lack the normal definition and differential characteristics, may be early and subtle evidences of serious cardiac disease. These apparently minor variations must be fully appreciated.

The presence of cardiac murmurs is usually, but not always, proof of heart disease. An interesting evolution has occurred relative to the significance of murmurs; the time is not remote when the greater part of cardiologic teaching was occupied by these adventitious sounds. Now, the emphasis is rightly placed on the diastolic murmur and its closely related presystolic murmur. The former is the characteristic murmur of aortic insufficiency and at times the murmur of mitral stenosis, whereas the presystolic murmur is positive proof of the existence of mitral stenosis.

The interpretation of systolic murmurs, particularly of those occurring at the base of the heart, to the left of the sternum, must be cautious, for these murmurs often have little clinical significance. They may be the result of augmentations in flow of blood, or they may result from respiratory movements under certain anatomic conditions, and in no way from cardiac impairment. The left basal cardiac area has been appropriately named the region of auscultatory romance.

Right basal systolic murmurs, particularly when they are loud and are transmitted into the carotid vessels, or extensively over the thorax, are almost invariably indications of disease. The same is true of the apical systolic murmur, especially when it wholly replaces the first sound and when it is transmitted into the axilla. When an apical systolic murmur, or one situated at the left basal area is the only evidence available, the major chances are that the heart is not structurally impaired. Nevertheless, insurance companies even today place convincing emphasis on these findings and frequently reject perfectly normal applicants or penalize them with exorbitant premiums so that they are denied protection. The justification of the insurance companies, of course, lies in the fact that their actuarial experience of many years is largely based on mass statistics dealing with murmurs per se. The failure and impossibility to separate data on this

basis results in mortality figures unfavorable to murmurs in general. It is hoped that thirty years hence sufficient accurate and diversified data will be available to alter the present-day criteria of acceptance and rejection.

The presence of thrills almost invariably indicates disease of the heart or great vessels.

Cardiac arrhythmia frequently leads to the diagnosis of heart disease, when in reality the heart is not impaired. Sinus or respiratory arrhythmia is frequently present even when hearts are normal, particularly hearts of infants and children, although this type of arrhythmia occasionally is an accompaniment of heart disease, especially among older patients. The occurrence of extrasystoles when the heart is normal has already been mentioned.

The detection of auricular fibrillations or flutter would render untenable the opinion that the heart is healthy, owing to their almost constant association with heart disease. However, there are instances in which auricular fibrillation occurs as a transient phenomenon, and ultimately no evidence of impairment of the heart can be determined. This is particularly true in some cases of hyperthyroidism.

One would also hesitate to render the opinion that the heart was normal in the presence of well established hypertension, owing to the known mechanical effects of this condition in causing the development of cardiac hypertrophy and its consequent impairment of function.

In the appraisal of the patient who maintains that he has had heart disease, for a considerable number of years, and whose history and whose present examination fail to show evidence of heart failure, one at once becomes skeptical regarding the existence of heart disease. It is of course possible that heart disease had existed or still exists, but in the majority of cases it would argue strongly for a normal heart.

The opinion that the heart is normal can be entertained when no history of illness capable of producing heart disease is elicited, and when no true cardiac symptoms and no conclusive physical signs of heart disease are present.

The electrocardiograph has proved to be a very helpful adjunct in completing the data necessary to arrive at the opinion that the heart is healthy. The high incidence of graphic alterations in the presence of heart disease places additional value on the electrocardiogram when it is normal in all respects. In considering the patient of middle



life, concerning whom the suspicion of coronary disease is always a formidable factor, the cardiovascular appraisal is never complete unless electrocardiographic study has been carried out. There are many instances in which the electrocardiogram discloses the first conclusive evidence of the disease. It is similarly important in certain cases of hypertensive heart disease, and particularly in that group of cases in which coronary disease coexists. I do not wish to imply that a normal electrocardiogram precludes the presence of heart disease, for such an interpretation would be utterly fallacious. However, a normal electrocardiogram in the absence of other conclusive signs or symptoms of impairment of the heart adds considerable weight to the opinion that the heart is healthy.

In concluding the consideration of the means of arriving at a conviction that the heart is healthy, it is apparent that these means consist in the skillful use of the methods which comprise the art, and the knowledge which comprises the science, of medicine. By eliminative deduction, bits of evidence, incriminative and exonerative, are judiciously weighed and accepted, or discarded, as the case may be, and the ultimate conclusion is reached by logical and scientific means. The physician must reach the conclusion with certainty and conviction, so that he is able to render his verdict in absolute terms and remove the horrors of doubt from the patient's mind.

No diagnosis exists that is more valuable than knowledge that the heart is normal.

### THE HISTOLOGIC GRADING OF SQUAMOUS CELL CARCINOMA OF THE LIP\*

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SINCE the beginning of the microscopic examination of tumor tissue, pathologists have formed opinions regarding the malignancy of neoplasms. Hanseman (1902) was perhaps the first to express a conviction regarding the relation between the microscopic structure and the malignancy or clinical course of their growth. He wrote: "Tumors disseminated through the body show a high degree of anaplasia; those of unusual local growth without dissemination have little anaplasia. Theoretically, I take it for granted that the greater the anaplasia the greater the tendency to form metastases." Hanseman in following up some of his cases found his theoretical deductions to be true in the majority of cases.

In 1920, Broders, entirely unaware of Hanseman's work, published a method of grading the malignancy of carcinoma of the lip according to

the amount of cellular differentiation and lack of differentiation. In the last ten years he has applied this method of grading to large groups of carcinoma from various locations with uniformly good correlations between the histologic picture and the clinical postoperative course. Numerous workers have confirmed Broders' work (Greenough, 1925; Martzloff, 1923; Weber, Davis, Barringer, and Caylor). The method has met with the approval of many surgeons throughout the country (Judd, Horsley, Dietrich, Duncan, and Ward); and consequently has already influenced surgical practices.

On the other hand, many pathologists have been unable to find any relation between the microscopic structure and the prognosis of a tumor. Two of the more recent papers on this aspect of the question are those of Plaut (1927) and Reimann (1928). Plaut has written an extensive critical analysis of the literature on the histologic prognosis of tumors.

The microscopic sections of eighty-four cases of carcinoma of the lip which had been treated at the University Hospitals between 1916

\*Presented by invitation before the Minneapolis Surgical Society on May 21, 1931, being the prize winning essay of the Minneapolis Surgical Society for 1931. A detailed report on the results of treatment obtained in cancer of the lip at the University Hospital has been made by Drs. O. H. Wangenstein and O. S. Randall.

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and 1928 were used for examination. Without reference to the history of the case, the microscopic sections of tumor were studied and assigned a particular grade according to Broders' classification, *i.e.*, Grade I, 0-25 per cent of the cells undifferentiated (75-100 per cent of the cells differentiated); Grade II, 25-50 per cent of the cells undifferentiated (50-75 per cent of the cells differentiated); Grade III, 50-75 per cent of the cells undifferentiated (25-50 per cent of the cells differentiated); Grade IV, 75-100 per cent of the cells undifferentiated (0-25 per cent of the cells differentiated). Pearly bodies, flat squamous cells, keratin, and prickle cells were considered as evidences of differentiation of the cells; hyperchromatic nuclei, irregular nuclei, increase in the nucleo-nucleolar and the nucleocytoplasmic ratios were all considered as evidences of undifferentiation. The mere presence of numerous mitoses was not taken into consideration very much except as the mitoses were of irregular and bizarre forms. Ewing states that "amitosis is frequently observed in rapidly growing tumors and in some cases may be the chief mode of cell division." While the belief prevails that the number of mitotic figures is a fair indicator of the degree of malignancy there is evidence that this may prove very false, according to some workers (Plaut, 1927).

#### RESULTS

Total number of cases studied—84.

All of the growths, except one, were primary on the lower lip. Information as to certain details is lacking in some cases.

The initial lesion was described as follows:

Pimple—3 cases

Cold sore—5 cases

Leukoplakia—2 cases

Crack—3 cases

Itching lesion—1 case

Not described—67 cases

Small nodule—3 cases

The average duration of the lesion before the patient saw a doctor was 1.45 years (ranging from 0 to 18 years).

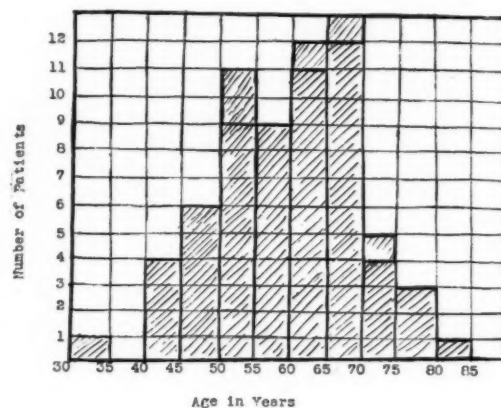
The average time elapsing from the time the patient first consulted a doctor to the time that adequate therapy was commenced was 1.05 years (ranging from 0 to 13 years).

The average total duration of the lesion before operation was 2.5 years (range from less than 1 month to 18 years).

Area of these lesions varied from 0.5 to 45 sq. cm.

The average surface area of lesions of Groups 1 and 2 was 3.75 sq. cm. and of lesions of Groups 3 and 4 was 3.8 sq. cm., which difference is well

THE AGE DISTRIBUTION OF PATIENTS WITH CARCINOMA OF THE LIP



within the limits of error of the method. The range of surface area in lesions of Groups 1 and 2 was from .5 to 12 sq. cm. and in lesions of Groups 3 and 4 was from .5 to 10. (The growth of largest surface area was not graded because microscopic sections were not available). Hence, there is no correlation between the size of a tumor and its microscopic grading, as has been suggested by some writers.

In Groups 1 and 2, 30 per cent of the lesions were described as being papillary and the rest ulcerated. In Groups 3 and 4, 25 per cent were described as being papillary and the rest ulcerating. Descriptive terms were given in only thirty-five cases.

In twenty-one cases the lesion began on the right side, in twenty-three on the left side, and in ten cases in the middle.

In 50 per cent (39 out of 78 cases) the lymph nodes were considered enlarged clinically. In ten of these thirty-nine cases in which lymph nodes were considered enlarged clinically, there was no microscopic evidence of metastasis, thereby illustrating the fact that enlarged lymph nodes are not necessarily metastatically involved. Actually only 37 per cent or less of this group of 78 cases had metastatic involvement of regional lymph nodes as proved by microscopic examination. In this group of cases metastases always occurred

first in nodes on the same side of the neck as the primary lesion.

#### TYPES OF OPERATIVE TREATMENT AND RESULTS OBTAINED

##### I. Cases which were treated by local excision of the primary lesion plus resection of the tributary lymph nodes. (This includes only those which have adequate follow-up (9 cases)).

1. Recurred three months after operation and died fifteen years later from carcinoma of the lip.
2. Living and well fourteen years after operation.
3. Died from carcinoma of the lip five years after operation.
4. Died in hospital three weeks after operation from another cause.
5. Living and well six years after operation.
6. Living and well four years after operation.
7. Died from cerebral hemorrhage seven and one-half years after operation.
8. Died one and one-half years later from pneumonia following bronchitis.
9. Died one year after operation from carcinoma of the lip.

*Summary:* Five four-year cures out of nine cases.

##### II. Cases which were treated by local excision of the lesion alone (8 cases).

1. Living and well without signs of recurrence twelve years after operation.
2. Died one and one-half years after operation from carcinoma of lip.
3. Living and well without recurrence twelve years after operation.
4. Died from carcinoma of the lip one and one-half years after operation.
5. Died from pneumonia five years after operation.
6. Died from pneumonia five years after operation.
7. Died from carcinoma of the lip one year after operation.
8. Died from carcinoma of the lip one year after operation.  
(Growth was present for ten years before and treated with x-ray for four years before operation).

*Summary:* Four four-year cures out of eight cases.

##### III. Cases which were treated by local excision of the lesion and excision of the tributary lymph nodes (12 cases).

1. Living and well six years after operation.
2. Living and well five years after operation.
3. Died in 1931 from coronary sclerosis (fifteen years after operation for carcinoma of the lip).
4. Living and well four and one-half years after operation.
5. Living and well four years after operation.
6. Living five years after operation but has carcinoma of lip at a new site.
7. Died from carcinoma of lip three years after operation.
8. Died from carcinoma of lip two years after operation.
9. Living and well five years after operation.
10. Living and well seven years after operation.
11. Living and well five years after operation.
12. Living and well five years after operation.

*Summary:* Ten four-year cures out of twelve cases.

Considering the fact that block dissection of the neck was generally done only in those patients with evidences of cervical metastases and that there is a much larger percentage of four-year cures in the group of cases in which a dissection of the nodes in the submental and submaxillary as well as local excision of the growth we see the advantage of these procedures over local excision of the growth unaccompanied by other procedures.

Brewer (1923) in a clinical grouping of compiled statistics from clinics where a five-year cure is reported found that in Group 1, in which the primary lesion only was removed, 66 per cent were well and without evidence of recurrence five or more years. In Group 2, in which the primary lesion and the anatomically related lymph structures had been removed but without lymph node involvement, 92 per cent resulted in five-year cures. In Group 3, in which the pri-

mary lesion and related lymph nodes had been removed but with positive evidence of involvement of the latter, 34 per cent showed five-year cures.

#### MICROSCOPIC GRADING

Slides were obtained for grading in 66 cases.

Grade 1—31 cases (46.9%)

Grade 2—18 cases (27.2%)

Grade 3—15 cases (22.7%)

Grade 4—2 cases (3.2%)

Broders (1920) in 537 cases of epithelioma of the lip classified 15.8 per cent as Grade 1; 62 per cent Grade 2; 21 per cent Grade 3; and 1.1 per cent Grade 4. The difference in distribution between these two series may be accounted for by one or all of three facts: (1) the change in method of grading since 1920; (2) an actual difference in case distribution; and (3) a tendency on our part to grade the tumors lower, particularly when they are on the borderline between a Grade 1 and a Grade 2.

Thus far, adequate information concerning the patients after they left the hospital has been obtained in only thirty-four cases. I hesitate to base percentages and definite conclusions on such a number of cases and believe that the most information from this series of cases can best be obtained by inspecting the tabulation of the subsequent history of these cases in the groups as they were placed according to the microscopic examination.

#### GRADE I. TWELVE CASES FOLLOWED

No deaths from carcinoma within 5 years of operation except in one case, where the cause of death was doubtful.

- 17-196 Living and well in 1931, 14 years after operation (local excision and block dissection of neck).
- 17-248 Living and well with no signs of recurrence in 1931, 12 years after operation (merely local excision). Size .5 x 1 cm. Duration, 15 months.
- 22-248 Died from carcinoma of lip 5 years after operation (local excision and block dissection).
- 25-595 Living and well with no signs of recurrence in 1931, 5 years after operation (V-excision and dissection of submaxillary and submental glands).
- 26-286 Living and well with no signs of recurrence in 1931, 5 years after operation (V-excision and dissection of submaxillary and submental glands).
- 26-352 Living and well in 1931, 5 years after operation (local excision with radiation to neck), no signs of recurrence.
- 26-574 Died 8 months after hospital admission—cause not known, operation refused.

- 27-194 Living and well in 1931, 4 years after operation (local excision and block dissection).
- 28-14 Died 8 months after operation from causes unknown—perhaps not care.
- 27-524 Died 22 months after operation—death attributed to carcinoma of the lip.
- 26-801 Living and well without signs of recurrence 6 years after operation.
- 27-524 Living and well without signs of recurrence 5 years after operation.

#### GRADE II. TEN CASES FOLLOWED

Two deaths from carcinoma of the lip; one recurrence.

- 23-290 Died 7.5 years after operation (local excision only) from pneumonia (age 89 yrs.) No recurrence or metastases at the time of death. Size 4 x 1.5 cm.
- 23-291 Died 5 years after operation, from pneumonia, no recurrence or metastases at time of death (local excision only). Size 1.0 cm. in diameter. Duration, 6 months.
- 24-215 Living and well 7 years after operation (V-excision and resection of submaxillary and submental glands). No recurrence.
- 24-299 Died 11 months after operation with extensive metastases in left side of neck. The nodes were hard and fixed at time of operation.
- 25-517 Living and well in 1931, 6 years after operation. No recurrence.
- 26-345 Living and well in 1931, 5 years after operation (local excision and node dissection).
- 26-579 Died 6 years after operation from causes unknown.
- 28-303 Living in 1932 but with recurrence in lymph nodes 6 years after initial operation.
- 27-402 Living and well 4 years after operation (local excision and node dissection).
- 27-386 Died from carcinoma of lip 2 years after operation (local excision and lymph node dissection).

#### GRADE III. TEN CASES FOLLOWED

Five died in 3 years or less after operation from carcinoma of the lip.

- 16-141 Died 18 months after operation with carcinoma of face and neck. (Nodes free at time of operation).
- 16-246 Died from carcinoma of the lower lip 16 years after initial operation—reoperated because of recurrence several times.
- 20-126 Recurred 3 months after operation (block dissection of neck). Date of death unknown. Size .5 x .5 cm. Duration 6.5 years.
- 20-184 Died of pneumonia 20 months after operation (block dissection, and local excision).
- 22-6 Living and well, no recurrence 9 years after operation (neck dissection and local excision).
- 23-209 Died of carcinoma of submaxillary lymph nodes and general carcinomatosis 1.5 years after the onset. Size 1 x 1 cm. Duration 12 months.
- 23-224 Died 13 months after operation (block dissection of neck and local excision), from epi-

thelioma of lower lip with general metastases. Size not given. Duration 2 years.

- 27-220 Died from carcinoma of lip 3 years after initial operation (local excision and node dissection).
- 28-75 Living and well 4.5 years after operation (local excision and node dissection).
- 28-189 Living and well in March, 1932, 4 years after operation (node dissection and local excision).

#### GRADE IV. TWO CASES FOLLOWED

- 23-446 Died of carcinoma of lower lip 1 year after operation (local excision). Total duration 2.5 years.
- 27-384 Died with extensive metastases 2 months after operation and 5 years after onset (initial operation, local excision and node dissection).

#### DISCUSSION

The above cases, while not of sufficient number to confirm absolutely a relation between the microscopic picture and clinical course of the tumor certainly indicate a relation strongly in favor of the correlation which Broders has expressed. He states that among the known causes of death in his 537 cases of squamous cell carcinoma of the lip, deaths from carcinoma were as follows: none of Grade I; 54.9 per cent of Grade II; 84.2 per cent of Grade III; and 100 per cent of Grade IV.

That grading of tumors is of scientific interest only and can not be used for practical prognosis (MacCarty, 1931), I cannot agree with. Anything that will tell a surgeon that a patient's chance of living five years or longer without recurrence is closer to 100 per cent than to 5 per cent is of undoubted practical value.

It must be kept in mind that these grades are merely relative and the grade must be combined with other clinical facts such as the presence of metastases, fixation of the growth, etc. However, the microscopic grade is not to be minimized in relation to clinical evidence as is illustrated by Broders, who states that a Grade I carcinoma of the rectum with metastases may have a better prognosis than a Grade IV carcinoma without metastases. It should be emphasized again that the grade itself should be based entirely upon the microscopic findings without any reference to the clinical findings. It is only subsequently that the grade of malignancy of the tumor should be correlated with the clinical findings in an endeavor to treat the tumor and prognosticate concerning the probable termination.

I estimated the degree of cellular infiltration (lymphocytes?) and the degree of connective tissue reaction of the host on a basis of one to four

in these same 84 cases. The cellular reaction (lymphocytic infiltration) about the tumor was very easily judged and classified, but on checking it up afterwards with the history of the patient and with the above assigned grade of the tumor there was an utter lack of correlation. The same was found to be true of the fibrosis and hyalinization around the growth. However, the amount of fibrosis and hyalinization was very much more difficult to judge. All authors do not agree as to the significance of lymphocytic infiltration and fibrosis. Some claim that the lymphocytes open a path for the cancer (Borst quoted by Plaut (1927)). Hanseman regarded lymphocytic infiltration as an unfavorable sign while many recent workers, such as MacCarty (1931), believe that fibrosis, hyalinization and the amount of lymphocytic infiltration are in proportion to the degree of resistance of the patient.

#### CONCLUSION

The grading of tumors according to Broders' plan I believe to be well worth while in squamous cell carcinoma of the lip as an aid in practical prognosis. The point that needs emphasis is that microscopic grading should be done independent of clinical findings and only later combined with them in forming a prognosis. As far as I could discover from the study of these few cases, the amount of cellular and fibrous reaction around the tumor is of no prognostic value.

There is no correlation between the microscopic grade of the tumor and its size.

Carcinoma of the lip is a lesion whose incidence increases rapidly both absolutely and relatively with advancing age. The average delay before treatment was two and one-half years in this group of cases, patient and medical man having been about equally responsible.

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## THE MODE OF SPREAD OF CARCINOMA OF THE RECTUM\*

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IT is unfortunate that the diagnosis of carcinoma of the rectum is often made too late. Most sufferers from this neoplasm present striking symptoms, and the rectum is readily explorable by the index finger. Why then the late diagnosis? Some reasons can be offered for this: false modesty, or a tendency on the part of the sufferer to attribute symptoms to hemorrhoids or other less serious trouble, and failure of the physician to examine the rectum with the finger early, or his failure to recognize the lesion when the examination is made.

Rectal carcinoma is the most common form of intestinal malignant disease, and comprises about 4 per cent of all carcinomas invading the body.<sup>1</sup> Its serious nature, its common occurrence, the major and habit-changing operation necessary for cure, the all too frequent late diagnosis, and the appalling number of patients who come for examination after the growth has extended to parts distant from the local lesion, led to this survey of its mode of extension and spread.

In a careful microscopic examination of 100 consecutive surgically resected specimens of carcinoma of the rectum and the surrounding tissues, McVay found metastasis to the lymph nodes in forty-seven. These were cases in which, after careful examination, operation was deemed advisable.

Statistics on operability vary widely, but investigators who have had considerable experience in the treatment of rectal neoplasms agree that the number of frankly inoperable cases is entirely too large. Rankin stated: "Among the less fortunately circumstanced, one finds inoperability ranging as high as from 75 to 80 per cent, while in private clinics and practice, 50 per cent is probably a fair estimate." In his review of 1,727 cases of malignant disease of the rectum, 782 (45.3 per cent) were considered inoperable, and surgical

intervention was deemed unwise. In 343 (19.8 per cent) palliative procedures only were possible, leaving only 602 (34.9 per cent) in which resection or excision of the malignant growth was possible.

Low operability goes hand in hand with late diagnosis. From a study of the reasons for this, we were impressed with various bizarre and early forms of metastasis. McVay emphasized the fact that there is no relation between size of growth and extent of regional involvement of the lymph nodes. We, too, were impressed with the relatively common occurrence of distant metastasis, when local growths were small and patients gave a short history of trouble.

Rectal carcinoma becomes inoperable by: (1) local extension, with fixation to adjacent and perhaps vital organs; (2) extensive involvement of lymph nodes, and (3) distant metastasis through the blood stream. The pathologic characteristics of any growth and the patient's state of health are, of course, of importance when determining operability, but these factors are not of concern here.

We reviewed 260 cases of malignant rectal disease, selected from 447 consecutive cases in which operation had been performed. In the remaining 187 (42 per cent) there was no evidence of extension to adjacent structures, nor of local or distant metastasis.

W. J. Mayo has observed that local extension renders a lesion inoperable more often than metastasis. Studies by many others have substantiated his observations. Local attachment and metastasis were common in the group we studied. Local attachment and extension to nearby structures occurred in 109 cases, and peritoneal perforation in eighteen more. Sites of extension were as follows: to the pelvic walls, forty cases; to the bladder, twenty-four; to the prostate gland, seventeen; to the uterus, ovaries and vagina, ten; to the seminal vesicles, six; to the perineum, anus and urethra, one case. The peri-

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toneum over the tumor was extensively involved in eleven other cases. Attachments of the tumor to other structures were in most instances caused by inflammation and less often were caused by direct extension of the malignant process, so that in itself adherence of the lesion to adjacent structures is not a contraindication to surgical extirpation.

Many studies of the rectal lymph nodes have been recorded. Poirier, Cuneo and Delamer have divided the collecting trunks of the anus and rectum into three groups: the inferior, middle and superior. The inferior group drains the cutaneous margins of the anus, with efferent channels passing to the inguinal regions. The middle group empties from the anocutaneous region, the upper limit of which was the white line of Hilton. Part of the efferent vessels extend through the columns of Morgagni to the rectal mucosa, others ascend on the lateral wall of the rectum, traverse the anorectal nodes, and join with the collecting vessels of the upper part of the rectum to terminate in the nodes of the mesorectum. Less commonly, these efferent vessels follow the middle hemorrhoidal vessels, or emerge beneath the levator ani muscles along the inferior hemorrhoidal vessels. The superior group of lymphatic structures drains the mucosa of the anus and rectum, with the efferent vessels passing through the muscular coat and extending upward and backward to the nodes in the mesorectum.

Villemin, Huard and Montagné, by a method of injection, found that the drainage of lymph from the upper part of the rectum was strictly abdominal.

Miles more recently has described the means of spread of carcinoma of the rectum. He has noted that there are three lymphatic systems, the first of which is intramural, consisting of two distinct, freely communicating networks, one in the submucosa, and one between the muscular layers, continuous above with the networks of the pelvic colon and below with those of the perianal region and with the inguinal nodes. The intermuscular portion connects with the second portion of the lymphatic systems, which is subserous, and also lies between the external muscular coat and the perirectal fat. By means of this second portion of the lymphatic system, a detached carcinoma cell may wander before entering the extramural or third portion of the system. Extramural spread may take place downward, later-

ally, or upward. The downward channel accompanies the inferior hemorrhoidal vessels, and the tissues traversed are those of the ischiorectal fossa, the external sphincter muscles, and the perianal skin. From here the channels empty into the internal iliac nodes. In the lateral extension of the disease, the levator ani muscles and pelvic fascia, coccygeus muscle, pelvic peritoneum, prostate gland or uterine cervix, base of the broad ligament, and base of the urinary bladder are traversed. Efferent vessels from here reach the uterine-iliac group of nodes. The paths of the upward main channels of spread accompany the superior hemorrhoidal veins, and traverse the lower mesocolic and retrorectal nodes, the pelvic mesocolon, and from thence the nodes that lie at the bifurcation of the left common iliac artery and along the aorta. Miles also emphasized that progress of the carcinomatous cells may be arrested and produce nodules at any point. In estimating the extent of the spread, it is important to know that whenever metastatic growths are visible, distant invisible metastatic growths are likely to be present. Clinical experience in general agrees with this view, and with the method of spread of rectal carcinoma that it suggests.

In our series, the involvement of lymph nodes by carcinoma in 113 cases was as follows: perirectal, seventy-one cases; mesenteric, fifteen; inguinal, fourteen; iliac, five; aortic, five; axillary, two; and omental, one case. This involvement was verified in each instance by microscopic study. Involvement of perirectal nodes does not in itself indicate inoperability, as evidenced by its common occurrence in resected specimens. Metastasis to other lymph nodes usually renders the lesion inoperable. We have observed another case of anorectal carcinoma, with large growths like involved lymph nodes, in the skin, following the line of the perineal and scrotal raphe, and from the base of the penis to the nodes of each groin. In the cases of involvement of distant lymph nodes, the surgical procedures consisted of biopsy of the inguinal and axillary nodes, and in some instances colostomy, when obstruction was imminent.

It is commonly recognized that metastasis to the liver occurs by way of the blood stream. W. J. Mayo, McArthur, Smith and others have explained this on the basis of emboli of carcinoma cells being released from the rectal neo-

plasm, and being distributed through the portal circulation.

Demonstrable distant metastasis occurred in seventy-one of our series of cases: to the liver in forty-three; to the lungs in twelve; to the small bowel in seven; to the omentum in one case; to the eye in one; to the bones in two cases, and to the regional veins in one case. In three cases there was diffuse abdominal carcinomatosis, and in one case, a large number of cutaneous metastatic nodules. The involvement of bone was of the skull, with large, grossly palpable nodules, proved on microscopic examination to be adenocarcinoma. Pulmonary metastasis in this series was determined by roentgenologic studies. In another series of 110 cases studied by Buie in 1924, pulmonary metastasis occurred in nine. Palliative procedures, exploration, or biopsy were instituted in cases in which distant metastasis was obvious.

#### SUMMARY

Carcinoma of the rectum is the commonest form of intestinal neoplasm. Its diagnosis is often made too late. In 260 (58 per cent) of 447 cases of carcinoma of the rectum, local extension of the growth, or metastasis occurred. Any given lesion may become inoperable by one or all of three modes of extension: local extension, metastasis by the lymphatic system, or distant dissemination by means of the blood stream. The order of frequency of occurrence of extension by these three routes in our series was metastasis by way of the lymphatic system in 113 cases, by local extension in 109, and by distant blood borne metastasis in seventy-one. Inoperability may develop in any given case by involvement through all three routes. No attempt has been made to separate the cases in which metastasis or exten-

sion by more than one of the three ways occurred. Local metastasis by way of the lymphatic system of itself may not contraindicate operation, for, as in this series, in seventy-one cases metastasis to regional lymph nodes was found only in the specimens resected.

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## VASOMOTOR RESPONSE OF NORMAL AND HYPERTENSIVE INDIVIDUALS TO THERMAL STIMULUS (COLD)\*

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THE study of vasomotor irritability and blood pressure response has been handicapped by the lack of a suitable standard stimulus. Many methods of stimulation have been proposed, but owing to the complexity of these procedures, they have proven of little practical value.

Recently Hines and Brown reported a study of the vasomotor response of some ninety-seven individuals to the stimulus, cold, and found that this stimulus resulted in an apparently specific response. If the validity of the results of the study can be proven, the test will be of inestimable value in ascertaining the vasomotor irritability of individuals as well as in determining the existence of pre-hypertension in individuals susceptible by virtue of these excessive vasomotor responses.

This investigation of the response of blood pressure to the stimulus, cold, was ascertained in 130 dispensary and hospital admissions. The subjects were at rest for a period of at least one-half hour, and in most instances for a longer period. At the end of the rest period the blood pressure was taken with the cuff on the left arm, and then the right hand was inserted up to the wrist in a bath of ice water. The blood pressures were then taken at thirty second intervals for a period of three minutes. The temperature of the ice water averaged 4.3 centigrade. Twenty-two of the patients were women with a definite hypertension, while the male hypertension group numbered twenty-four. Only those individuals who had a persistent elevation of the systolic blood pressure of 150 mm. of mercury or more, and in whom there was a cardiac hypertrophy with fundal arteriosclerosis, were selected as hypertensives. A normal control group consisted of thirty-two males and twenty-eight females. In addition, the responses of eight patients suffering from lues and ten patients with various other

diseases were ascertained. Six cases were omitted from this report because of incomplete data. The responses were classified as to the age and sex of the individuals.

Table 1 shows the age and sex distribution of the hypertensives and normal cases.

TABLE I. DISTRIBUTION OF CASES ACCORDING TO AGE AND SEX

AGE	MALE		FEMALE	
	HYPERTENSION	NORMAL	HYPERTENSION	NORMAL
9-19	0	1	0	0
20-29	1	2	0	8
30-39	0	4	3	5
40-49	3	10	2	4
50-59	5	9	5	3
60-69	9	3	2	5
70-79	4	3	6	3
80-89	2	0	4	0
Total	24	32	22	28

Figure 1 represents the average systolic and diastolic pressures of both the normal and hypertensive males, classified as to decades. The systolic increase in pressure of the hypertensive series is indicated by S.H., and the systolic increase of the normal series by S.N. The diastolic pressures are similarly indicated D.H. and D.N., respectively. It will be noted that the average systolic pressure of the hypertensive individuals shows a greater rise than the normal and that the pressure after rising returns to normal more slowly, giving the hypertensive curves a plateau effect. In the 40 to 49 decade curve for the hypertensive systolic rise, the dotted line indicates the response of an individual supposedly suffering from hypertension. It will be noted that the response of the individual is also hypertensive in quality. In the male series, of the ages 80 to 89, the dotted line indicates the average hypertensive increase in response to the stimulus. The unbroken line indicates the response of individuals suffering from hypertension, who are in a state of decompensation.

Figure 2 represents the average responses of

\*Read before The Central Society of Clinical Research at Chicago, November 4, 1932, and before the Minnesota Society of Internal Medicine, Rochester, Minnesota, November 14, 1932.

both normal and hypertensive females, by decades. Here again it will be noted that the systolic hypertensive responses to the stimulus are characterized by a greater increase in pressure

and hypertensive individuals following the application of the stimulus. The average systolic increase in the male hypertensive group is greater than the increase in the normal group. The mini-

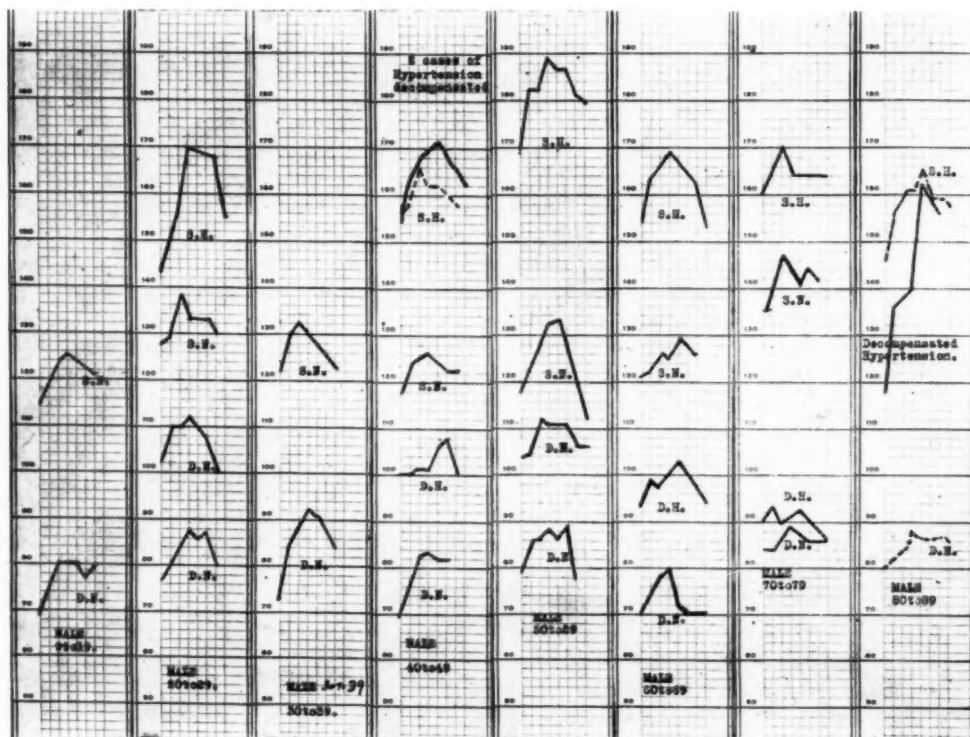


Fig. 1. Curves representing the average response of normal and hypertensive males in the series.

as well as a slower return of the pressure to normal, as compared to the normal. In both the male and female series, the diastolic pressures show no characteristic type of response.

TABLE II

AGE	MALE				FEMALE			
	S.N.	D.N.	S.H.	D.H.	S.N.	D.N.	S.H.	D.H.
9-19	10	11	0	0	0	0	0	0
20-29	10	11	28	10	9	9	0	0
30-39	12	19	0	0	11	14	12	12
40-49	8	13	17	8	7	5	21	8
50-59	15	10	20	8	7	3	18	6
60-69	7	10	15	9	9	7	17	9
70-79	11	5	12	3	10	5	9	6
80-89	0	0	19	8	0	0	9	5

Table showing the average systolic and diastolic rise in pressure (mm. Hg) in response to stimulus (cold) in normal and hypertensives according to decades.

Table 2 shows the average increase in systolic and diastolic blood pressures in both the normal

and hypertensive series. The minimum increase in systolic pressure for the male hypertensive series is 12 mm. of mercury, as compared with 7 mm. in the normal male group, the maximum 28 mm. compared with 15 mm. in the normal series. The diastolic increase in blood pressure for the male hypertensive series is less than the increase in the normal male series. The minimum diastolic increase for the hypertensive is 3 mm. of mercury as compared with 5 mm. in the normal male series; the maximum 10 mm. compared to 11 mm. in the normal male group. In the female series, we find again the greater increase in the average systolic pressure in the hypertensives except in the 70 to 79 age group, where the normal rise is 1 mm. of mercury more than that of the hypertensive group. The plateau effect of the hypertensive response, however, is still present. The minimum average systolic in-



crease in the female hypertensive series is 9 mm. of mercury, while the average increase in normal series is 7 mm.; the maximum is 21 mm. as compared with 11 mm. in the normal female.

ber of females, while the Arabic numerals indicate the males. The maximum rise in the normal systolic pressure occurred in the fourth period in five cases, etc.

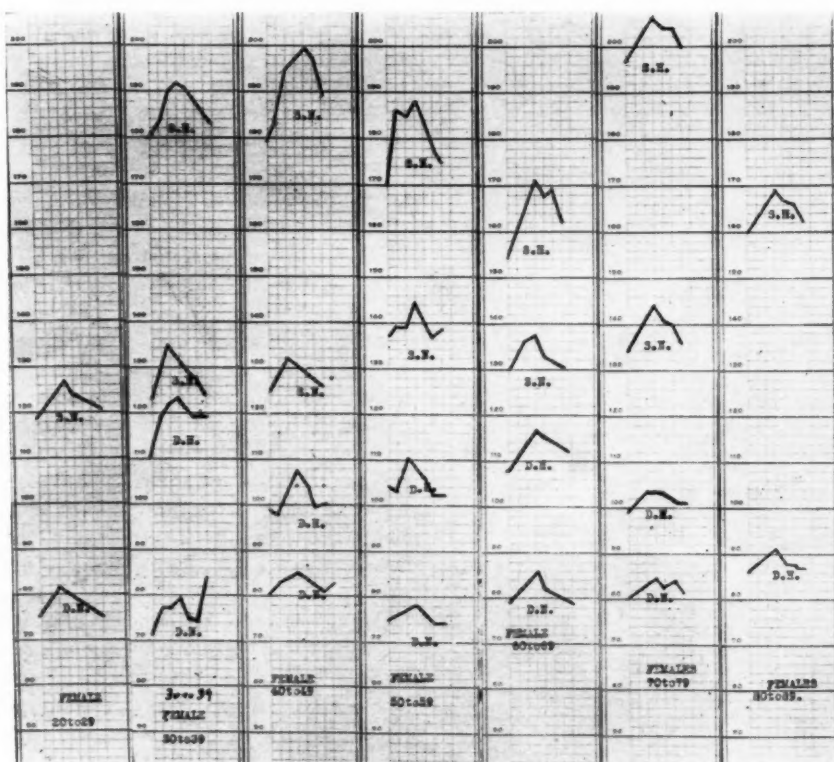


Fig. 2. Curves representing average response of normal and hypertensive females in the series.

In contradistinction to the male group, the diastolic increase in blood pressure in the hypertensive female series is greater than the increase in the normal female series. The average minimum diastolic increase for the hypertensive female is 5 mm. of mercury, while that of the normal female series is 3 mm. The maximum diastolic increase for the hypertensive female is 12 mm. of mercury, as compared to an average increase of 14 mm. of mercury for the normal series. In the 30 to 39 age group, the hypertensive diastolic increase is greater than the same increase in the normal series.

Table 3 represents the time interval in which the maximum response in blood pressure occurred. The Roman numeral indicates the num-

TABLE III

Time	1	2	3	4	5	6	7
Normal							
Systolic		II	3	IV 1	2	0	
Diastolic		0	III 1	III 4	0	1	
Hypertension							
Systolic		0	II 1	III 3	2	0	
Diastolic		II 1	I 1	II 2	1	1	

Table showing the time (30 second periods) of greatest rise in systolic and diastolic pressures. Roman numerals indicate number of females and Arabic the males.

The plotted average returns reveal that in most instances, besides the greater systolic re-

sponse in hypertensives, there is a tendency of the hypertensive curves to assume a plateau effect due to a slow return of the pressure following the initial response. Figure 3.—Graph I in-

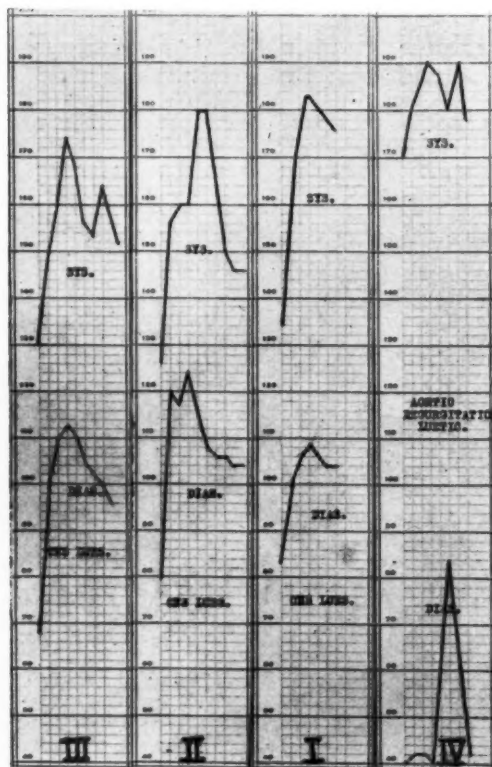


Fig. 3. Graph I. Curves representing average blood pressure response of eight patients suffering from tertiary lues. Graphs II and III. Responses of two individuals suffering from central nervous system lues. Graph IV. Response of patient with aortic insufficiency of luetic origin.

indicates the average systolic and diastolic rise in blood pressure of eight tertiary luetics in whom there was no involvement of the heart or aorta. The diagnosis in each case was central nervous system syphilis. The maximum systolic increase in pressure is 49 mm. of mercury, and the maximum diastolic increase 25 mm. The original blood pressure returns of those in this series fell within normal limits, while the response to the stimulus was exaggerated and corresponded to the responses of hypertensive individuals. Graphs II and III of Figure 3 represent the responses to cold of two individuals suffering from syphilis of the central nervous system, and show

the same marked exaggeration in responses as those in Graph I of Figure 3. Graph IV (Fig. 3) is the response of a male, aged 39, suffering from luetic aortitis and insufficiency. Here there is a maximum systolic rise of 20 mm. of mercury occurring during the 4th period, and a maximum diastolic rise of 40 mm. occurring during the 6th period. The diastolic increases in the central nervous system series and in the patient with aortic insufficiency are closely related, but apparently the systolic rise differs markedly.

Figure 4.—Graph I represents the responses of a male patient, who entered the hospital with cardiac decompensation. The responses show a marked increase in systolic pressure with a plateau effect to the curve, characteristic of either the hypertensive reaction or the reaction of patients with central nervous system lues. Autopsy examination proved the case to be one of essential hypertension. Graph II represents the response of a male, sixty-nine years of age, who entered the hospital decompensated. Systolic 1 is his response on the day of admission. Systolic 2 is his response taken twenty-four hours before death. The response at the time of admission shows a bizarre type of curve not indicative of any specific response. Autopsy showed him to be suffering from essential hypertension. Graph III represents the systolic and diastolic response of three individuals who entered the hospital in cardiac decompensation. The type of response indicated a hypertensive character, and clinical study and the return of compensation proved all three cases to be hypertensive in etiology.

Figure 5.—Graph I is the vasomotor response of a woman who developed hypertension during her last pregnancy. At the time of her stay in the hospital, there was no evidence of a cardiac or renal failure, and eye-ground studies showed no changes in the arterioles. Following delivery the blood pressure remained elevated, but as yet there is no clinical evidence indicating vasospastic phenomena. The curves are characteristic of hypertension. It is interesting to note that her mother died from high blood pressure. Graph II is the vasomotor response of a ten year old child, which is exaggerated and simulates the hypertensive type of curve. Both parents are suffering from essential hypertension. This is the only record we have that apparently simulates the prehypertensive curves of Hines and Brown.

The physiological mechanism by which these

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vasomotor responses occur is unknown. The response is the same regardless of which limb is used, or even if all four limbs are subjected to the stimulus. Hines and Brown ruled out local

immersed in the ice bath is too short to produce either a chemical or hormonal change sufficient to bring about the exaggerated responses obtained. The majority of the patients complained

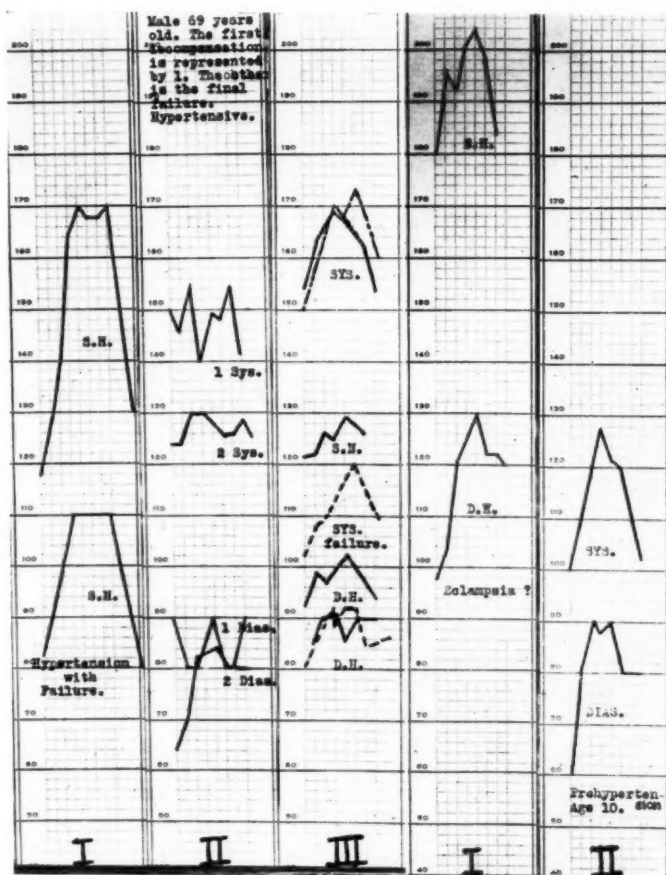


Fig. 4 (left). Graph I. Lower curve represents response of patient in cardiac decompensation. Response is within normal limits but hypertensive in character. Upper curve represents the response after return of compensation.

Graph II. Curve 1 represents stage of decompensation while curve 2 indicates failure with patient in moribund state.

Graph III. Pressure response in three patients with cardiac decompensation.

Fig. 5 (right). Graph I. Response of patient with eclampsia.

Graph II. Response of a ten year old boy supposedly prehypertensive.

chemical and hormonal influences by constricting the stimulated arm by means of a tourniquet, thus closing off the circulation, and were able to obtain the same responses as were previously ascertained in these individuals. In twelve of our subjects we repeated the experiment with the stimulated arm constricted and found that there was no change in the character of the responses. In addition, the length of time that the hand is

of pain in the stimulated area. Many of the hypertensive patients became irritable and cried because of the cold sensation in the hand, while others attempted to shorten the period of observation by removing their hands from the ice bath. These complaints were more frequent in the hypertensive patients than in the normal group. Dawson has noticed that in predisposed individuals the reflexes act excessively to emo-

tional and other stimuli, and it is possible that the vasoconstriction thus produced may persist after the stimulus is removed. Normally the blood pressure is proportional to the force and rate of the heart beat as well as the degree of peripheral resistance. When the hand is immersed in water at a temperature of 4° centigrade, it becomes red, indicating a dilatation of the minute vessels and a constriction of the arterioles. The number of arterioles constricted, however, in the local area is too small to produce the vasomotor responses in this experiment. Further, the continuous activity of the vasomotor center is necessary to increase peripheral resistance through constriction of the splanchnic and cutaneous arterioles. The stimulation of the proximal end of a severed sciatic nerve results in an elevation of blood pressure resulting in an increased supply of blood to the injured area. The stimulation by cold simulates this mechanism. In the instances of the sciatic stimulation, the rising pressure is produced by constriction of the splanchnic and other vessels, resulting in increased blood supply to the stimulated area. Likewise, it seems probable that the discomfort, pain, and local circulatory change produced by the stimulus of cold may result in a reflex stimulation of the vasomotor center, resulting in an increased circulation to the area stimulated. It seems probable that in the hypertensive individuals, because of the vasomotor irritability, the activity of the vasomotor center persists, giving us the characteristic type of response.

#### SUMMARY

1. The vasomotor response to the stimulus of cold was ascertained in 124 individuals. In addition, isolated responses of individuals suffering from various diseases were obtained. The number of cases studied is small, but in conjunction with the work by Hines and Brown, of Rochester, Minnesota, it seems that hypertensive

individuals reveal an apparent specific type of response in both males and females. This response in the hypertensive patients is a more marked elevation of the systolic blood pressure, with a slower return to the basal pressure, resulting in a curve of the plateau type.

2. Normal individuals also have apparently a specific response, which is shown by both sexes, in a rapid rise and fall of the systolic pressure, producing a peak type of curve.

3. The diastolic changes were not uniform nor specific in their character.

4. The mechanism producing the response is apparently reflex in origin, bringing about a generalized vasoconstriction of the arterioles with an exaggeration of the response in individuals predisposed to hypertension.

5. One patient in the series gave a response that we feel might be construed as a prehypertensive type of curve.

6. A study of the response of the patients with syphilis of the central nervous system indicates a marked exaggeration, the cause of which is unknown, but may be the result of vascular changes produced by the disease.

7. The application of this test proved of value in determining the etiology of four cases of heart disease.

8. If further study indicates that these responses are specific in character, this test will be of great value not only in the determination of etiology of heart disease, but in the recognition of those individuals who have latent or prehypertension and are poor life insurance risks.

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## PROCTOSCOPIC DIAGNOSIS OF CHRONIC ULCERATIVE COLITIS\*

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SINCE the original publication in 1924 by Bargen, of his work in identifying the diplo-streptococcus and its relationship to the pathologic picture in chronic ulcerative colitis, much attention has been focused on this disease. Emphasis has been placed almost entirely, however, upon the etiologic phase of the disease and its corollary, the rôle of specific vaccine therapy in the treatment of chronic ulcerative colitis. That such a disease entity exists is no longer questioned but the picture presented by the disease is familiar to only a limited number of men.

Much may be accomplished in the way of inducing remissions of the disease by early diagnosis, and cases presenting a restoration of haustra in the colon and something like normal lumen diameters will be seen more frequently as the result of treatment instituted early in the course of this ulcerative process. When the medical profession accepts the appearance of blood in the stool as a symptom calling for proctoscopic examination a long step will have been taken, for it is by proctoscopic examination only that most of the early cases may be diagnosed. Certain underlying facts in the pathogenesis of chronic ulcerative colitis make it very difficult or altogether impossible to differentiate this disease by any other technic.

The inflammatory process starts low in the rectum almost invariably and ascends, as the disease becomes more chronic, into the upper rectum and colon. It is rare indeed that a case of chronic ulcerative colitis will manifest itself in a portion of the colon beyond vision through the proctoscope and leave the bowel and rectum below free of the disease. In a large series of proved cases of this disease, Bargen has shown that not more than 5 per cent of his cases were in colon segments not accessible to the proctoscope. In occasional early cases and in those which have started in the rectum and are of low virulence, the involvement will be limited to the rectum. Logan found that in a series of cases studied 20 per cent were limited to the rectum.

It is frequently impossible to detect any roent-

gen evidence of disease until it has ascended into bowel areas more readily visualized. Proctoscopic examination offers the only means of making an early diagnosis in such cases.

When it is realized that sigmoidoscopy offers a 95 per cent chance of making an early diagnosis, a knowledge of the picture in such a case becomes imperative. Chronic ulcerative colitis, early in its active phase, exhibits a diffuse hyperemia which, in accordance with the above stated tendency of the disease to start near the anus and ascend, will be seen to fade off gradually into normal mucosa. As the disease develops, the mucous membrane becomes edematous and traumatizes and bleeds very readily. A very easy and reliable means of bringing out this evidence is to gently stroke the mucous membrane with a cotton swab through the proctoscope. This slight trauma will cause bleeding in cases of chronic ulcerative colitis.

The ulcerating character of the mucosa develops through the formation of myriads of miliary minute superficial abscesses which rupture easily, leaving a pin point sized ulcer. No large ulcers will be seen early in the course of the disease and it must be recognized that these small ulcers spread diffusely over the mucosa and eventually produce the picture of the disease.

It is much more probable that one would see these early evidences of development were he to encounter the disease early in its course. As the disease becomes chronic, a new phase in the picture is met with: healing or remission is instituted and some scarring occurs. The scars appear here and there where the bases of the miliary ulcers had been and produce a glazed granular appearance of the mucosa. Others will exhibit a peculiar ground-glass appearance. The striking thing in the whole picture is the diffuseness, no normal appearing mucosa being found between the ulcers or indeed until the upper limits of involvement are reached, when the granular or ground-glass appearance fades off into normal mucosa.

As secondary infection occurs in the ulcerated mucosa larger ulcers may appear. These ulcers

\*Read before the Hennepin County Medical Society, Minneapolis, April 13, 1932.

vary in size from a few millimeters to three or more centimeters, forming a ragged or irregularly outlined ulcer. It is not at all to be inferred that these latter lesions are the true picture of chronic ulcerative colitis, but rather that secondary infection having occurred the many miliary ulcers have merged together in this area. These larger secondary ulcers may confuse the examiner and lead to wrong diagnosis.

In the process of healing, scar tissue formation is such that two constant features are produced in the endoscopic picture. The valves of Houston are normally quite sharply edged while in chronic ulcerative colitis these sharp edges are ironed out into a rounded elevation in the rectal wall or in extreme cases may have disappeared entirely. As a result of the same process, namely, scar tissue contraction in the mucosa, submucosa and muscularis, thickening of the wall with a tube-like contraction will at times progress to a point where a lumen of only two or three centimeters is left. One may see occasionally a rectal or rectosigmoid stricture in association with chronic ulcerative colitis, where the deformity is caused by this contraction of the scar tissue in the wall of the rectum or sigmoid. This stricture is the end point of a process which to some degree is so constant that it may be looked upon as one of the diagnostic criteria of chronic ulcerative colitis.

Occasionally as scar tissue forms and contracts, many small islands of mucosa stand out on the surface of the bowel. In certain cases these may be so prominent in a remission period as to cause a diagnosis of multiple polyposis to be entertained. Closer examination, however, will reveal these many raised areas as mucosa pinched up into polypoid forms by the scar tissue at their base.

The following two histories serve to point out the diagnostic value of the proctoscopic examination in rectal and colon lesions.

#### CASE REPORTS

*Case 1.*—A. S., white, an unmarried woman aged thirty-seven, gave a family and past history which was of no significance. The history of her present complaint was that, three weeks following an acute sore throat for which she did not consult a physician or stop her work as a saleswoman, she began to see moderate amounts of bright red blood in her stools. She had only two stools a day but these were quite soft and mushy. She had no rectal pain or protrusion

although her complaint was that she was troubled by bleeding hemorrhoids.

The general physical examination revealed nothing of direct importance. Her throat appeared normal and a rectal digital examination was negative. Her hemoglobin, leukocytes and urine were considered satisfactory. Fluoroscopy following a barium enema was reported "colon negative." At proctoscopic examination there was found an active chronic ulcerative colitis limited to the lower two-thirds of the rectum. The mucosa was thick, spongy and edematous with diffuse pin point sized ulcers throughout the involved area. The mucosa bled readily when touched with cotton. There was no contraction of the rectum and the valves of Houston were not rounded.

*Case 2.*—H. R., a white female aged twenty-three, gave a history that in the fall of 1929 she had had an attack of what was called by her physician intestinal influenza. She had complained of some cramping pain in her pelvis and had noticed this usually brought on a bowel movement which usually was thin and contained bright red blood. Her stools had numbered from five to eight each twenty-four hours. This attack had lasted three weeks when her stools had returned to two a day and appeared normal. She had had two similar attacks before the onset of her present one, which is of two months duration. She thinks eating food with much roughage brings on the attack. She has lost five pounds in weight since the onset of her trouble.

Her physical examination revealed tenderness low in the pelvic midline. She was somewhat anemic in appearance and poorly nourished. Her hemoglobin was 58 per cent (Dare), red blood cells 3,620,000 and leukocytes 7,860. Stool examination shows gross blood, many pus cells but no parasite nor ova. Colon fluoroscopy was reported normal. Proctoscopic examination showed a chronic ulcerative colitis with the upper border of involvement just below the recto-sigmoid junction. The mucosa was granular and showed diffuse miliary ulceration. There was slight contraction of the bowel lumen.

Direct examination of the lumen and mucosa of the rectum and bowel enable a diagnosis of ulcerative colitis to be made earlier than any other method, and a truer idea of how the diseased tissue appears may thus be obtained. Colon fluoroscopy is of value chiefly in determining the proximal extent of the disease and checking the colon above the range of the proctoscope for additional involvement from polyps, carcinoma or stricture.

In a paper as limited as this it is not possible to include the differential diagnostic points between ulcerations due to ameba histolytica, tuberculosis, poisoning by the heavy metals, trauma, and the few additional diseases which may

produce ulcerating lesions in the rectum or colon. Suffice it to say that these lesions are rare while chronic ulcerative colitis is relatively common and that the appearance of the mucosa as it is described above is not easily confused with ulcerations due to any other known disease.

#### SUMMARY

It has been well shown that chronic ulcerative colitis is a definite disease entity.

Early diagnosis of this disease will effect a great increase in remissions.

Proctoscopic examination offers the examiner approximately a ninety-five per cent chance of making the diagnosis early.

Proctoscopic examination is urged in all patients complaining of bleeding per rectum or persistent diarrhea.

The significant features of the sigmoidoscopic picture of chronic ulcerative colitis are: (1)

glazed granular mucosa which bleeds easily when only slightly traumatized; (2) tubular contraction and thickening of the bowel and rectum; (3) ironed out or rounded appearance of the valves of Houston.

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### PREPARING PATIENTS FOR OPERATION ON THE PROSTATE GLAND\*

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ONCE the outflow of urine from the bladder has become obstructed as a result of gradual enlargement of the prostate gland, there are set in motion forces in the urinary tract which in their effort to overcome this barrier result in lasting injury to the entire urinary system. If the condition is left uncorrected, death may finally result.

These efforts by the musculature of the bladder to overcome urethral obstruction, and to force the urine past the increasing barrier of prostatic tissue, result first in irregularity of the previously even surface of the bladder, producing coarse trabeculation that is characteristic of the disease. If relief is not given, these trabeculations become larger and the interstices between them develop into pouches known as cellules, which, over an extended period of time, rapidly develop into diverticula. In extreme cases the diverticula may reach the size of the bladder it-

self. Since these diverticula are without muscular coat, they are often incapable of emptying, so there is always present a goodly amount of stale, infected urine, often of foul odor, which will prevent any possibility of relieving the bladder of infection until the diverticulum is removed. Therefore, to the gravity of an operation for removal of the prostate gland is added the further risk of diverticulectomy before complete relief of symptoms is obtainable. Such a combination of operations is frequently more than patients of advanced age can stand, and yet to do the one without the other is to afford but little aid to the patient, unless, by happy circumstance, the diverticulum empties with the bladder, in which case there is no need for its surgical treatment.

Consequently, when preparing patients for operation, it is of first importance to ascertain how great an amount of structural injury has occurred. This is best ascertained by the cystogram, taking the roentgenograms with the bladder full, and the roentgen tube so placed as to project the

\*From the Section on Urology, The Mayo Clinic, Rochester, Minnesota. Read before the Fourth Congress of the Panamerican Medical Association, Dallas, Texas, March 21 to 25, 1933.

shadow of the diverticulum beyond the shadow of the bladder. These roentgenograms should be followed by one taken after the bladder has been emptied, to ascertain whether, if a diverticulum is present, it has emptied. Such cystograms show the bladder, in cases of prostatic obstruction of not long standing, usually to be pyramidal in shape, a deformity which the bladder assumes in its endeavor to force the urine past the obstruction. If the obstruction is of longer duration, the deformity is more irregular, and cellulæ and diverticula occur more frequently. These cystograms, besides giving valuable information regarding diverticula, also safeguard against the possibility of the symptoms produced by a cord bladder being mistaken for those of prostatic hypertrophy. The tabetic bladder, or bladder that is paralyzed by disease of the spinal cord, never assumes the pyramidal contour that comes with urinary obstruction, but remains spherical, and if trabeculations occur they are of much finer texture. If a roentgenogram has been made of the urinary tract before the cystograms are made, in order to exclude the presence of calculus, and if rectal palpation demonstrates an hypertrophied gland, there is no necessity for cystoscopic examination; the significant symptom, the characteristic cystogram, and the enlarged gland are sufficient information with which to make the diagnosis. Cystoscopic examination may complicate the surgical treatment by producing an unnecessary reaction, for a urethra deformed by prostatic enlargement will not well tolerate the passage of rigid instruments.

Having ascertained the anatomic changes produced by the disease, it is next important to discover if possible what are the physiologic changes that have developed, for urinary obstruction is invariably associated with more or less renal impairment, depending on the extent and duration of the obstruction. Thus, slight prostatic hypertrophy, with but 10 or 15 c.c. of residual urine, will cause such slight renal impairment as to be almost undemonstrable, whereas many hundred cubic centimeters of residual urine are usually associated with an injured renal mechanism, resulting in retention of many milligrams of urea, and the almost complete absence of excretion of phenolsulphonphthalein or methylene blue.

Obviously, preoperative care in the presence of these two extremes is very different. The patient with a small amount of residual urine, and

without serious infection of the prostate gland or bladder can be operated on safely, without preliminary preparation, whereas the patient who shows unmistakable signs of associated renal injury may require many weeks of the most careful and painstaking care. Efforts must be directed toward elimination of the retained toxic substances, as estimated by the urea content of the blood, together with every effort to improve renal function. Elimination is helped by application of a hot pack to induce sweating; before the patient is placed in such a hot pack the administration of pilocarpine hydrochloride grain 1/10 (0.006 gm.) given subcutaneously and acetylsalicylic acid grains 10 (0.65 gm.) given by mouth will be found to be of much assistance. Before the patient is subjected to elimination of fluids through the skin, the fluids should be available in the body; therefore, in extreme cases it is advisable to administer into the vein 2,000 c.c. of physiologic solution of sodium chloride prior to induction of sweating. The intravenous injection should be repeated at least in six hours if the retention of urea is extreme, whereas, if the value for urea is not too greatly elevated, 1,500 c.c. daily usually will be sufficient. However, until the value for urea in the blood has returned to normal, it is well to try to keep the output of urine as high as 3,000 c.c. daily. The necessity for fecal elimination need hardly be emphasized, except to observe that saline cathartics are the best in these cases, for they help increase the elimination of fluid, and so permit of ingestion of more fluid, which is a condition most to be desired under the circumstances. Taking of water and other fluids by mouth is to be pressed to the patient's easy tolerance, for it has been demonstrated, both clinically and experimentally, that ingestion of too much water can produce definite toxic effects. Therefore, forced administration of fluids should be by way of the venous system, and the fluid should be physiologic solution of sodium chloride; then toxic effects are not to be anticipated.

In order to increase elimination of toxic material by enormous increase in the output of urine, the prostatic obstruction must be overcome for the time being. To effect this, one has the choice of three methods. First, a catheter may be passed every few hours, and all residual urine removed. However, frequent passage of a catheter through a urethra already rendered abnormal



by prostatic changes is seldom possible without discomfort or irritation. This regimen, also, does not permit of constant, unobstructed flow of urine, a most important consideration if elimination is to be maximal. Second, a catheter may be placed in the urethra and allowed to remain for several days. In the majority of cases this is the preferable means of establishing uninterrupted outflow of urine, especially in cases in which retention and toxicity are slight and the period of preparation will not be prolonged. Third, a suprapubic drainage may be made, and the urine continuously collected. This method is superior to the other two, for it does not necessitate wearing a catheter in the prostatic urethra, which is already congested and deformed by hypertrophy of the prostate gland. Of so decided benefit is this method, that in a few weeks the gland will shrink markedly. In the more serious cases it is the procedure of choice, for once drainage by this method has been established it can be indefinitely prolonged without risk, and preparation for ultimate operation can be extended over a period of months, or even years. In the last few years approximately 25 per cent of the patients operated on at The Mayo Clinic for prostatic obstruction have been prepared for operation by this method. However, since the transurethral method of treatment has replaced prostatectomy, this percentage has dropped, for the risk of transurethral resection is so little as compared with prostatectomy that one feels justified in undertaking the operation in many cases in which prostatectomy would be contraindicated. In 1932, of 276 patients operated on by this method, forty-eight (17.39 per cent) had previously undergone suprapubic cystostomy. For these forty-eight patients, therefore, transurethral resection was the second stage of an operation performed in two stages. The postoperative course, when two stages are necessary, is longer than when transurethral resection can be performed at once. Healing of a suprapubic sinus takes time, whereas, the majority of the patients treated by transurethral resection only, leave the hospital on the fifth, sixth, or seventh day after operation. When large amounts of tissue require removal through the urethra, the risk of postoperative complications is less if a suprapubic drain is in place.

When there is no appreciable urinary infection, and renal function has been injured little

or none as a result of the prostatic hypertrophy, then there is no occasion to drain the bladder before operation. If such drainage is undertaken, there frequently will occur a febrile reaction on approximately the fifth to the seventh day thereafter; the reaction lasts several days, during which the patient loses his appetite, feels dull, and often constitutes a much poorer surgical risk than before. Cabot and Meland have recently shown that if renal function is determined by excretion of phenolsulphonphthalein, before and after such an attack, it will be found to have diminished after the attack. I therefore never hesitate to perform transurethral resection, once the diagnosis is made, providing renal function is within normal limits and infection is not severe. Delay, and institution of urethral drainage, seem to favor development of postoperative infection, if it has been absent before. The indwelling catheter irritates the prostatic urethra. It may render acute an infection which has been chronic, and when an acute infection is produced in the presence of residual urine, serious complications are likely to occur.

If, because of infection or impaired renal function, urethral drainage is deemed necessary for a time, it is best to perform bilateral vasectomy, thus guarding against epididymitis. This complication can prove most serious, and may lessen chances of recovery of a seriously debilitated patient. Vasectomy is easily performed, and absolutely insures the patient against such an eventuality.

Recent work by Clark and Helmholtz has demonstrated that the best insurance against urinary infection is to render the urine highly acid by means of drugs, for the organism most frequently encountered is the colon bacillus. This organism multiplies only with difficulty if the acidity of the urine is high; if the pH falls below 5.4, such infection seldom can persist. This extreme acidity usually can be produced by administration of ammonium nitrate, grains 15 (1 gm.) given three times a day in enteric coated capsules. If the medication includes methenamine, complete sterility of urine before operation usually can be obtained. When this is not possible, prescribing of a ketogenic diet for a week before operation seldom will fail to result in sterile urine. Such a diet is high in fat, and the ketone bodies produced by it have marked germicidal value in addition to that resulting from the acidity which it

produces. The presence of ketonuria can readily be tested, for when a small amount of ferric chloride is added to the urine the mixture takes on a reddish brown color if ketonuria has occurred.

Following a preoperative procedure such as has been outlined in this presentation, in 1932

at The Mayo Clinic operations by the transurethral method were performed in the 276 cases of prostatic obstruction that have been mentioned; there was not a death. In the last six years, 499 such operations have been performed at The Mayo Clinic by this method, with but seven deaths, a mortality of 1.4 per cent.

### INTERMITTENT ATTACKS OF FEVER RESULTING FROM PARTIAL BRONCHIAL OBSTRUCTION WITH MINIMAL PULMONARY SYMPTOMS\*

PORTER P. VINSON, M.D., and CHARLES K. MAYTUM  
*Rochester, Minnesota*

ANY factor which interferes with normal drainage of the tracheobronchial tree will eventually produce suppurative pulmonary disease. The condition may be caused by foreign body, neoplasm, inflammatory reaction or any abnormality that reduces the lumen of the trachea or bronchi. In most instances, the local manifestations in the lung produce the usual symptoms of pulmonary disease, such as cough, expectoration, pleurisy and hemoptysis. Constitutional reactions are taken for granted, and are attributed correctly to absorption from suppurative foci in the bronchi or parenchymal tissues of the lung.

The existence of malignant disease in the bronchi without clinical signs and symptoms and the absence of the usual roentgenoscopic data have been noted by various authors, especially Parker, who called attention to the presence of metastasis of these tumors to the cerebrum in cases in which the primary growth was not recognized until necropsy was performed. That partial stenosis of a bronchus can exist and produce marked constitutional symptoms from suppurative processes in the lung, with mild pulmonary manifestations, is not generally known, and we are reporting three illustrative cases to emphasize the necessity for considering pulmonary suppurative disease in the presence of intermittent chills and fever.

*Case 1.*—A man, aged sixty years, was examined in The Mayo Clinic March 2, 1931. He stated that he had contracted malaria in childhood, and that for forty years he had experienced chills followed by fever of 102° to 103° F., lasting a day at a time. At first, these episodes were noted about once every six months and were precipitated by over-exertion. Eight years after the onset of symptoms, he was thought to have typhoid fever, and following this illness he "caught cold," and daily fever, loss of weight, bloody sputum and the organisms of tuberculosis in the sputum were noted. In four months most of his symptoms subsided, but he continued to have slight cough with an occasional streak of blood in a small amount of sputum. In the two years preceding his examination, he had had attacks of chills, fever and prostration once every week, but this was not associated with any alteration in the amount of cough or expectoration. He also had mild digestive symptoms that were attributed to disease in the gallbladder, and roentgenoscopic examination of this organ revealed the presence of a large gallstone. It did not seem likely that this was the cause of the intermittent febrile attacks.

Clinical and roentgenologic examination of the thorax did not reveal significant data. Smears of the blood were negative for malaria and the leukocytes were within normal limits. The sputum did not contain bacilli of tuberculosis. March 7 the temperature was 100.2° F. and reexamination of the thorax revealed diminution of breath sounds at the posterior base of the right lung, associated with considerable moisture over the same area. Bronchoscopic examination was made two days later and a stricture was found in the mesial division of the bronchus to the lower lobe of the right lung. This was dilated and aspirated. The patient remained free from symptoms for a little more than three months, when he had another chill with fever, and an increase in sputum with some odor to the

\*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota.

breath. Further bronchoscopic aspiration was done June 22. The patient was free from symptoms until August 21, when he again noted a slight chill with fever following severe exertion. Before this attack the breath was foul. At the time of the last report, February 22, 1932, the patient had been in good health.

*Case 2.*—A man, aged fifty-five years, came for examination because of recurring attacks of chills and fever for thirty-nine years. The onset of disability had begun following pneumonia. He did not recall whether the attacks were associated with pulmonary symptoms during the first nine years, but for thirty years they had been accompanied by cough and the expectoration of non-odorous mucopurulent material which was sometimes pink. For ten years the episodes would occur about three or four times a year, but for twenty years they occurred on an average of once a month, and were precipitated by overwork, worry and overeating. At the beginning of an attack, the hands felt dry; drowsiness and a severe chill would be followed by fever as high as 104° F. Then cough began with sputum as described. Recovery was complete in two or three days. There were no pulmonary symptoms during the attacks. A bronchoscopic examination had been made three years before the patient came to the clinic, but apparently nothing had been done and the patient continued as before.

At the time of examination, the patient weighed 129 pounds. He appeared poorly nourished, as his height was 5 feet, 9¼ inches. He had experienced a chill one week previously and the temperature was still 101.4° F. Leukocytes numbered 7,000 in each cubic millimeter. The sputum did not reveal the organisms of tuberculosis. Examination of the thorax was essentially negative. Roentgenoscopic examination revealed some thickening of the pleura at the base of the right lung. On bronchoscopic examination a small amount of pus was found exuding from the bronchus to the lower lobe of the right lung. The lumina of several bronchi were narrowed, but a true stricture was not identified. The bronchi were thoroughly dilated and aspirated.

In May, 1931, the patient returned for examination because of discomfort in the region of the left kidney.

He had had only two or three mild chills with fever since the bronchoscopic treatment and had gained 16 pounds. Roentgenoscopic examination of the thorax was reported to be negative, and the bronchoscope revealed a small amount of pus in the bronchus to the middle lobe of the right lung. The bronchi were again dilated. In October, 1932, the patient reported that he was in excellent health.

*Case 3.*—A man, aged twenty-six years, came for examination December 5, 1932, because of recurring chills and fever for three or four years. The attacks came late in the afternoon, recurring about three or four times a year and were ushered in with a chill. This was followed by fever to 104° F., a mild, hacking non-productive cough, great prostration and mild delirium. The following morning the temperature would be normal, and if the patient remained in bed the attack would terminate without further distress. If he got out of bed, the fever and chills would recur in the afternoon for three or four days. The last attack had been Monday, November 28, and the fever had continued until Friday, December 2.

The patient was well developed and well nourished, weighing 162 pounds. The leukocytes numbered 6,200 and the examination of sputum was negative for bacilli of tuberculosis. Examination of the thorax revealed an area of bronchiectasis at the base of the left lung behind the heart, with evidence of partial bronchial obstruction. Roentgenograms of the thorax showed nothing abnormal. The bronchoscope disclosed that a posterior division of the lower portion of the left main bronchus was partially stenosed and exuded purulent secretion. The stricture was dilated thoroughly and aspirated. February 5, 1933, a letter from the patient gave the information that he had remained perfectly well.

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#### CHARITY

The hardest lesson of all to learn is that the law of the higher life is only fulfilled by love, *i.e.*, charity. Many a physician whose work is in a daily round of beneficence will say hard things and think hard things of a colleague. No sin will so easily beset you as uncharitableness towards your brother practitioner. So strong is the personal element in the practice of medicine, and so many are the wagging tongues in every parish, that evil-speaking, lying, and slandering find a shining mark in the lapses and mistakes which are inevitable in our work. There is no reason for discord and disagreement, and the only way to avoid trouble is to have two plain rules. From the day you

begin practice never under any circumstances listen to a tale told to the detriment of a brother practitioner. And when any dispute or trouble does arise, go frankly, ere sunset, and talk the matter over, in which way you may gain a brother and a friend. Very easy to carry out, you may think! Far from it; there is no harder battle to fight. Theoretically there seems to be no difficulty, but when the concrete wound is rankling, and after Mrs. Jones has rubbed it in with cayenne pepper by declaring that Dr. J. told her in confidence of your shocking bungling, your attitude of mind is that you would rather see him in purgatory than make advances towards reconciliation. Wait until the day of your trial comes and then remember my words.—Counsels and Ideals from the Writings of William Osler.

## PRESIDENT'S LETTER

DURING the next few months, large numbers of young people will determine on which business or professional career they will prepare themselves for at the University. Undoubtedly many of them, contemplating the study of medicine, will consult the family physician, and no more kindly advice could be given a young man or woman aspiring to the practice of medicine as a career than to point out the already overcrowded condition of the profession..

It is our duty to these young people who may depend upon us for advice, and it is our duty to the profession itself, and to the public, to discourage young people from embarking upon a professional career in a field which is far from being able to support the number of highly trained people already depending upon it for a livelihood.

Yours truly,



President,  
Minnesota State Medical Association.



# EDITORIAL

## MINNESOTA MEDICINE

*Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.*

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The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

Vol. XVI JULY, 1933 No. 7

## OUR EIGHTIETH ANNUAL MEETING

Great annual meetings are becoming a habit with the Minnesota State Medical Association. It may be said with due modesty, after the 80th annual gathering at Rochester in May, that the Minnesota meeting takes on the character of the interstate assembly which it may become in years to come.

The Rochester meeting presented so much of surpassing interest that no medical man in this part of the world could afford to miss it—and few did. The registration broke all previous

records and it included a surprising number of physicians from neighboring states.

It is difficult, even at this date, to set down briefly the high lights, scientifically, of the extremely varied three-day program. Some 200 men took part in the sessions, many of them of international note in their specialties.

For a good many, the small group demonstrations, developed and emphasized at this meeting following their inauguration in St. Paul a year ago, were the most valuable events of the program. The exhibit halls in St. Mary's Nurses' Home offered a bewildering variety of these demonstrations and intimate lectures during demonstration hours each day. Half a dozen small rooms along the corridors connecting the halls were crowded to the doors. Radium treatment with A. U. Desjardins lecturing; methods of anesthesia with J. S. Lundy demonstrating; the treatment of rectal disorders with L. A. Buie, demonstrating; the physiotherapy demonstration, to mention only a few, were major attractions of the year. The exhibits, often neglected for more dramatic entertainment, also became a major feature of the meeting.

The daily clinics of the Mayo Clinic and the afternoon of programmed clinics drew a surprisingly large group of visitors also, it is interesting to note.

Naturally, a state meeting of the scope of Minnesota's annual medical event holds more than a purely scientific interest for the medical man. It provides his annual opportunity to re-define his position socially and economically as citizen and doctor. The current public interest in the problems of care of the sick and reduction of medical costs, and the great practical difficulties confronting the doctor himself, made the economic and sociological sessions of greater than ordinary interest to the average practitioner. This interest was witnessed by the huge crowds that gathered Monday and Tuesday night at the Methodist Church. The committee in charge of the program for these events are to be congratulated on their happy choice of speakers for both nights.

Morris Fishbein, C. H. Mayo, W. J. Mayo,

Dean Lewis, to mention only a few of the distinguished medical speakers, bear potent names. They call for respectful hearing from men of all classes and professions and they speak authoritatively when it comes to the question of shaping medical aims and policies in the United States. The stirring talk of the one non-medical speaker was perhaps the high light for many on those notable programs. This talk was made by Archbishop John Gregory Murray and probably left no one who heard it unmoved by the high obligation laid upon the doctor in these times, as this distinguished clergyman saw it.

Reflecting the obvious interest of the profession in general in these matters, the House of Delegates took action in some form on an important and varied order of business that touched in some fashion on most of the great problems of the day. Medical care of the poor, formulation of principles with regard to contract practice, to medical relations with insurance companies, to public education, to the disproportionate increase in professional men, particularly physicians, provoked thoughtful discussion, also a notable absence of precipitate and unconsidered action which reacts to the credit of the entire profession in Minnesota.

The profession is deeply indebted to its hosts, the Olmsted-Houston-Fillmore County Medical Society, for the hospitality shown it during the three days. The Mayo Clinic and St. Mary's Hospital, especially, put every splendid facility at the disposal of the meeting and contributed immeasurably to its success. No comment on the meeting could be complete, either, without mention of the pleasant social affairs arranged for the doctors and their wives.

It is worth mentioning that this meeting, due to careful planning in advance and to energetic sale of exhibit space, was the least expensive held by the state society in many years, a fact which takes on a special significance in view of the interest and variety of the program and the excellence of meeting accommodations.

#### THE CANCER SURVEY IN MINNESOTA

It is always well in planning a campaign to know not only your own resources but as much about the enemy as possible. This was the idea that prompted the survey of the cancer situation in Minnesota last year by Dr. Frank Leslie Rec-

tor of the American Society for the Control of Cancer. Incidentally, the survey was made with the approval of the Council of our State Association, the Minnesota Hospital Association and the State Board of Health, and received the coöperation of various additional agencies such as the departments of health and Visiting Nurses organizations in the Twin Cities.

The report is most complete, contains a critical appraisal of the forces available in fighting cancer in our state and makes numerous recommendations.

The death rate from cancer in Minnesota has shown a steady and marked increase during the past twenty years. It is greater than that for the country at large, part of which is explained by the fact that out-of-state patients come to the Mayo Clinic and the Twin Cities for treatment. The increase in mortality in general is an actual increase, however, and not explained by better diagnosis or the increase in the percentage of the population now in the cancer age.

The cancer situation, therefore, presents a serious problem which is likely to become even more serious in the near future. The problem is primarily a medical problem, and it behooves the medical profession to exert its utmost energy to do everything possible to combat it. Are we as a profession doing all that can be done? While the survey gives a very fair appraisal of the good work that is being done by the Cancer Institute at the University, the Mayo Clinic and some of the larger hospitals, in the diagnosis and treatment of cancer, from the standpoint of the minimum requirements established by the American College of Surgeons for a proper cancer service at a general hospital, all of the hospitals in Minnesota fail to measure up to the standard. A few additions here and there would enable many of the larger hospitals to meet this standard. Some hospitals lack the required x-ray equipment, some a sufficient amount of radium, some the facilities for pathological diagnosis, and most of them the important follow-up of cancer patients necessary for evaluation of treatment given.

One of the recommendations made in the survey is that all general hospitals in the state caring for cancer patients that can meet the minimum requirements of the College, do so. It is admitted that it is impractical for the smaller hospitals that receive only a few cancer patients a year to attempt this, but that they refer their

patients with cancer, or suspected of having cancer, for diagnosis and treatment to institutions meeting requirements.

All the recommendations submitted by the survey are of value but we wonder whether they can all be carried out. The recommendation is made that the Cancer Institute at the University add another deep x-ray therapy machine and increase the radium in its possession to 1,000 mg. With the city hospitals in the Twin Cities and patients from all over the state being referred for treatment to the Cancer Institute there is doubtless the need for the Institute to expand.

The Institute should, of course, be used as much as possible for both undergraduate and postgraduate instruction in cancer, particularly in the interest of early diagnosis.

The survey also recommends the establishment of special record systems in hospitals, the use of the College of Surgeons' form, and the follow-up of patients by social workers under the supervision of a cancer committee of the staff.

Our State Medical Association should doubtless have its cancer committee. We will leave it to the Department of Pathology at the University whether it wants to establish a tumor registry and add more tissues to its collections. If provision is made for the study of such specimens—well and good.

We are not in a position to discuss the recommendation of the establishment of a Division of Cancer Control in the State Department of Health. Until we know what causes cancer, it is going to be difficult to control. Until such time, control must rely on early consultation, early diagnosis and thus early treatment.

The survey as a whole emphasizes the need for coöperation of medical and lay forces in the cancer fight. Continuous publicity regarding the need of early consultation for suspicious symptoms and the necessity of early diagnosis on the part of physicians are both essential to assure the early use of our limited but valuable therapeutic measures.

#### MEDICINE AND THE PUBLIC WEAL

The political ferment is working under enormous pressure. The spectacle of a Washington Administration groping to maintain the status quo so suddenly shifting to one of novelty enthroned is not so much the recipient of fear as

of awe. Let it be added that reverence is not yet attained but a hopeful people are not at all displeased with the prospect. These events have (temporarily at least) wafted away much of the heated atmosphere that developed soon after the Medical Cost Commission made its report. In this lull (and while we witness securities vendors, bankers and industrialists reaching out with avidity to accept the yoke) it behooves those of us engaged in medical practice to keep our heads and quietly demonstrate that our guild kept a soulful purpose clearly in view through all this financial travail. We have not deserted our job; few people indeed have been medically neglected.

Too large a percentage of the population, in this unemployment, may have been drawn out of the panels of private practice. But often in charity clinics they have kept contact with their former doctors. There has been little recrimination, despite the fact that often the doctor was as flat as the patient.

It is no time to make comparisons, but one at least cannot fail to escape: If our erstwhile financial geniuses had received in the last ten years the same quality of medical attention that they gave us as financial advisers—well, their ranks would have suffered a depletion something commensurate with our savings. However, perish this unhappy thought! The point at issue now rests with the circumstance that the Government will soon be directing (or owning) so many of our agencies of production and commerce it may be willing to let us continue a service that in the form of a guild was long ago adapted (far out of proportion to most other services) to the public weal.

E. L. T.

#### INTRAVENOUS UROGRAPHY

The new procedure of intravenous urography has brought out considerable discussion, pro and con, as to its real value in the armamentarium of the diagnostic clinic. Intravenous urography is the injection of a preparation into the veins, that is rapidly excreted by the kidneys. Many of these substances are on the market but the conclusions here recorded are based chiefly upon experience with skiodan. Anyone, with a well-developed vein technic, should be able to use it satisfactorily, and in the five years that the writer

has used it, there have been no severe reactions. The only conceivable contraindication to its use is marked impairment of the function of the cardio-renal systems. This procedure should be considered only as an adjunct to a cystoscopic examination, not to replace such an examination. Only when a perfectly normal response is obtained of both kidneys should it be accepted as final. If an abnormal response is found, this should be checked by a cystoscopic examination (if possible) including pyelograms, cultures, microscopic, and functional analyses.

The largest field for this examination is in patients where a cystoscopic examination is impossible or impractical. Where a stricture of the ureter exists, where acute infections are present in the urethra and prostate, and where there is marked enlargement of the prostate gland, intravenous urography should be resorted to.

Whenever a cystoscopic examination has been made and all attempts at catheterization of either or both of the ureters has failed, the intravenous method should be tried. It is very likely that it will demonstrate the reasons for this failure. Patients with severe pelvic or abdominal injuries present quite a problem to the urologist because of severe pain produced by motion of the lower extremities and by handling the patient. The intravenous route should be tried in these cases because a ruptured kidney, cut ureter, or ruptured urinary bladder can be very definitely diagnosed by this method. Much information can be obtained in both acute and chronic renal colic, both as to the function of the involved kidney and as to the amount of damage to the kidney tissue.

It is the opinion of the writer that this procedure should be included in the curriculum of every hospital, but with the note of warning that too much should not be expected of it. If it is carefully done, and the information that it gives is correctly interpreted, more correct diagnoses of urinary disease will be made.

G. T. NORDIN, M.D.

### THE CHICAGO EXPOSITION

Comparisons are odious. The Century of Progress Exposition at Chicago is different from the Columbian Exposition of forty years ago. Instead of the former classic architecture the present exposition is modernistic in effect, with

a blending of color and a utilization of a display of illumination which is magnificent.

The layout of the display has been well planned. Special buses transport the visitors from one end of the three and one-half mile extent of the grounds to the other, not interfering with pedestrians. The radio and loud speaker are much in evidence. The two steel towers over six hundred feet in height enable the visitor to obtain a beautiful bird's-eye view of the exposition grounds, the city, and the lake.

The fair has its midway of amusements, its commercial exhibits, of which the General Motor assembly plant is, perhaps, the outstanding one, and its scientific exhibits, which are the most interesting. The medical exhibits are housed in the Science building and possess an attraction to the medical man, although prepared for their appeal to the public, primarily. The exhibits of the Wellcome Research Institute, the Cleveland Clinic, and the Mayo Foundation, and the numerous displays of the pharmaceutical houses are of special interest to the medical man. The transparent illuminated man, made in Dresden and now owned by the Mayo Foundation, attracts considerable lay interest.

We can but admire the audacity of those responsible for the fair, in their perseverance in the project in spite of the times. Whether the fair proves a financial success or not, it is bound to prove a stimulus to those who attend.

### CONVALESCENT SERUM IN THE TREATMENT OF POLIOMYELITIS

The status of the treatment of preparalytic cases of acute poliomyelitis seems to require clarification. Although prevailing clinical opinions as to the efficiency of the treatment have been optimistic, few investigations have been adequately controlled. In two recent reports of controlled therapeutic tests, the evidence provided is not encouraging. Kramer, Aycock, Solomon and Thenebe record eighty-two cases about equally divided between those who received convalescent serum and those who did not. The Boston investigators concluded that their study offered no statistical evidence that convalescent serum is effective. Together with members of the poliomyelitis committee of the New York Academy of Medicine and his associates in the municipal hospitals, Park studied a total of 927 preparalytic cases of poliomyelitis, 519 of which were treated with convalescent serum; 408 patients were not given serum. The result of this study likewise does not afford statistical proof that the use of serum has any value in cases in which the cells of the central nervous system are already involved. The fact that the two controlled therapeutic tests gave similar results suggests that, heretofore, too much confidence has been placed in the treatment with convalescent serum. The need now is for additional evidence based on controlled studies which take into account the variants that make the problem complex. (Jour. A. M. A., October 8, 1932, p. 1266.)



## « A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

ONE of the greatest problems before the physician, upon whom modern conditions have thrust the task of public health education, is involved in a proper lay understanding of his aim and function in this matter.

Unfortunately, public health education is not simply a matter of formulation in popular language of urgent truths which must then be submitted in proper form to newspapers, radios and public speakers. If in so doing, the doctor does not succeed in appearing as a disinterested teacher, purely, and not as a peddler of wares, then his teaching is likely to fail of its mark.

In the minds of the physicians themselves, and probably in the minds of the majority of intelligent laymen, the doctor is merely acting as one human being who warns another of danger. He is simply discharging his duty as a conscientious, responsible person when he warns, for instance, of the dangers of self-treatment with patent cures for cancer, epilepsy or diabetes. The pitiful tragedies that result, as well as the shocking waste of money involved, are known to every physician. The physician is in the position, actually, of one who would—or would not—warn the oncoming engine, of a broken rail. Certainly, he would not hesitate to raise the warning signal. The Public Health Education Committee has acted comparably in sounding occasional warnings through its news service about the patent remedy evil.

In the minds of a surprising number of otherwise intelligent and conscientious lay persons, however, the doctor who points out this evil—and the facts he cites may be verified at any medical school in the land—is accused of having a competing commodity to sell. He is regarded as a very inferior sort of merchant who is attempting to sell his stuff, like any pill maker, without paying his way.

This contention, which has come up again recently following publication of the first bulletin in some months relative to proprietary and fake cures, brings up once more the whole subject of advertising by physicians, a subject which has received considerable attention in the last few years from organized medicine. If the physicians have not, as a body, particularly in Minnesota, seen fit as yet to enter into advertising competition with the patent remedy makers, it is not because they hope, instead, to defraud publishers of newspapers or owners of radio stations.

There are graver considerations involved having to do with the welfare of the whole public, why the medical profession should hesitate to claim superior cures on the same terms as Lydia E. Pinkham, for example.

No individual physician or group of physicians has any special claim to the medical knowledge accumulated through the centuries. This fund of knowledge with all its special skills has lengthened the span of human life by many years. It has saved immeasurable human suffering. And it could save immeasurably more if men would call on it more. If its possibilities are only partially realized, the fault lies largely in the ignorance and inadequate education in these matters of the public at large.

One wonders if it is not the responsibility of the press, as well as of the medical profession and the teaching professions and the church, to spread public knowledge of the most important facts in the world? If the newspaper editor were medically trained, the physician would gladly turn over to him the part of his task having to do with the public press. Failing that, the physician has seen no other way but to try, however inadequately, to do the work himself. It is not with him, a question of barter and sale, of profit here or cheating there. Instead he regards it as a mission laid upon him to save men from avoidable suffering and death.

The physician does not and would not charge the editor with pure commercialism in his stand. The editor undertakes many another cause without return for space of any kind. It is perhaps the doctor's failure that he does not always present the cause of public health urgently enough to enlist the editor as fellow crusader in the important business of saving lives.

## OF GENERAL INTEREST

A recent communication from the secretary of the Northern Minnesota Medical Association states that an excellent program is in preparation for the meeting which is to be held at Willmar, Minnesota, September 8, 9, and 10, this year.

Dr. E. O. Giere of Minneapolis, chief of staff of Fairview Hospital, was honored recently by medical associates and other friends at a banquet on the fortieth anniversary of the year he began the practice of medicine. A bound volume containing the signatures of former patients was presented to Dr. Giere. He formerly practiced in Madison, Minn., Watertown, S. D., and Saint Paul before locating in Minneapolis.

Dr. Adolph Hanson of Faribault was awarded a gold medal at the meeting of the Minnesota State Medical Association in Rochester in May in recognition of his achievement in discovering the active principle of the parathyroid gland and the isolation of its hormone.

The medal which is annually presented by the Southern Minnesota Medical Association for the best individual scientific exhibit at the State meeting was given this year to Drs. Ellis and Rosendahl of the University of Minnesota for their exhibit on causes of hay fever in Minnesota.

An organization of surgeons to be known as the Ramsey County Surgical Society was recently consummated for the purpose of investigating, through experimentation on the lower animals, particularly the dog, the fundamental principles of surgical technic, and to promote the free discussion amongst its members of the newer advances in such technic. It is felt that through this experimental work the younger members of the Society will be given an unusual opportunity for research. Officers elected for the coming year are: President, Dr. H. A. Drechsler; vice president, Dr. F. W. Mayer; secretary, Dr. Gerald P. Dunne; treasurer, Dr. John H. Wallinga, all of Saint Paul.

Suitable ceremonies were held at the Northrop Memorial Auditorium, Minneapolis, on May 4, 1933, in recognition of those who had served the University of Minnesota in one capacity or another for a period of thirty years. In the rather formidable list of those honored appear the following well known physicians and surgeons: Drs. Arthur E. Benjamin, James T. Christison, Alexander R. Colvin, William H. Condit, Charles A. Erdmann, James S. Gilfillan, Thomas B. Hartzell, Jennings C. Litzenberg, Arthur T. Mann, Walter R. Ramsey, Harry P. Ritchie, John T. Rogers, John L. Rothrock, Samuel E. Sweitzer, Henry L. Ulrich, S. Marx White, and Franklin R. Wright.

Fellows and interns of the Minnesota General Hospital, who completed their terms of service on June 30, 1933, will leave shortly to take up new work in various fields.

Dr. Fred Exner, Fellow, will have charge of the X-ray Department of the Bellingham General Hospital in Bellingham, Washington.

Dr. Stuart Shimonek will take up his new duties as Resident of the Gillette State Hospital, St. Paul, on July 1.

Both Dr. Charles H. Mead, Fellow in Surgery, and Dr. Luther Fisher, Fellow in Medicine, will enter private practice, Dr. Mead in Duluth, and Dr. Fisher in Pensacola, Florida. Dr. Mead's office address in Duluth will be 1100 Medical Arts Building.

The plans of Dr. Emmet Kehoe, Fellow in Medicine,

and Dr. Stanley Chunn, Fellow in Ophthalmology, are still indefinite.

Dr. Clayton Beecham, Surgery intern, has accepted a position as Resident in Obstetrics and Gynecology at Bell Memorial Hospital, University of Kansas, Kansas City, Kansas.

Dr. Louis Friedman will go to Europe early in the summer for further study.

Dr. George Hauser will enter Health Service in the University of Minnesota.

Dr. Robert Plant is to be a member of the staff of the St. Louis Maternity Hospital at St. Louis, Missouri, and Dr. Robert Cushing of the Rhode Island Hospital, Providence, R. I.

For three months Dr. Fred Jarvis will be connected with the Obstetrical Department of the Minneapolis General Hospital and will return to the Minnesota General Hospital at the end of that period.

Dr. James Tedder and Dr. Leo Wolfson have accepted Fellowships at the Minneapolis General Hospital, the former in the department of Dermatology and Syphilology.

Dr. Aileen Petri will serve for three months in the Bobs Roberts Memorial Hospital and will return to Minneapolis for work in the Institute of Child Welfare.

Residents of Ancker Hospital, Saint Paul, Minnesota, who completed their terms of service June 30, 1933, have made the following plans for the future.

Dr. M. O. Thoreson will practice in Saint Paul.

Dr. E. V. Fortmiller will go into practice somewhere in Oregon.

Dr. B. F. Sowers will practice in Michigan following a two months' canoe trip through Minnesota and Canada.

Dr. H. C. Andre will continue as surgical resident at Ancker Hospital.

Dr. T. R. Fritsche will continue on the eye, ear, nose and throat service and Dr. Robert Wheeland will also remain for a few months longer.

Dr. E. L. Maeder will remain another year on the obstetrics and gynecology service.

Among the present interns who will stay as residents are: Dr. T. R. Montgomery as pathologist; Drs. W. A. Merritt, J. H. Tillisch, B. H. Brunkow and R. J. Cairns as residents in medicine and the receiving room.

Those who will go as residents to other hospitals are: Drs. C. L. Cain, St. Joseph's, Saint Paul; C. W. Walters, Eitel, Minneapolis; G. W. Hopkins, St. John's, Saint Paul.

The Army has claimed Dr. J. J. Mack and Dr. R. H. Nyquist in national service.

Dr. E. B. Tuohy will go to the Mayo Clinic, Rochester, where he has a Fellowship.

Among the interns whose plans are as yet somewhat indefinite are the following:

Dr. H. W. Morgan will engage in general practice.

Drs. J. R. Cooper and B. T. C. Fenton will practice in Nebraska; Dr. N. W. Fawcett in North Dakota; Dr. C. C. Nelson in Essex, Iowa; Drs. H. V. Hullerman, E. A. Thacker, and W. C. Dine in Illinois; Drs. R. L. Windsor, E. M. Sorenson and G. Olson in Minnesota.

Dr. Alexander Slive plans to take postgraduate work at the University of Pennsylvania.

Drs. M. M. Heffron and J. M. Roberts have not made definite plans.

## PLASTIC SURGERY

The following resolution condemning sensational presentations of plastic surgery by irresponsible and non-representative individuals and groups was adopted by the Society of Plastic and Reconstructive Surgery at its stated meeting at the N. Y. Academy of Medicine on May 26, 1933:

"WHEREAS, sensational stories frequently appear in lay publications concerning the cosmetic repair of the face and body with special reference to the correction of nasal malformations and the eradication of the stigma of age; and

"WHEREAS, these stories convey the erroneous impression that plastic surgery is purely for cosmetic purposes and involves procedures that may safely be performed by lay cosmeticians in an environment that does not provide the strict asepsis and other safeguards of a hospital operating room; and

"WHEREAS, these stories are designed to appeal to and promote the exploitation of, unstable and often psychopathic individuals who have no genuine deformity but are overly sensitive to negligible imperfections and the changes wrought by age,

"THEREFORE BE IT RESOLVED, THAT the Society of Plastic and Reconstructive Surgery take steps to inform the public

(1) that plastic surgery is a regular surgical specialty, embracing the reconstruction of defects and malformations that interfere with normal function as well as the repair of gross cosmetic deformities;

(2) that those engaged in the practice of Plastic and Reconstructive Surgery require the same scientific and technical training as the practitioners of any other surgical specialty and are bound by the same ethics, adopted in the interests of the public, that govern all reputable physicians, and

(3) that the safe performance of even minor plastic and reconstructive procedures demands the precautions and safeguards of a first grade operating room;

"AND BE IT FURTHER RESOLVED, THAT this Society condemn the performance of any plastic operations whatsoever by lay cosmeticians and the use of beauty shops, hotel suites and convention halls for this purpose;

"AND BE IT FURTHER RESOLVED, THAT this Society warn the public of the dangers of any surgery at unqualified hands and the unreliability of sensational, self-aggrandizing publicity;

"AND BE IT FURTHER RESOLVED, THAT this society urge the community to recognize the social aspects of plastic and reconstructive surgery and make it available, at competent hands, to the poor as well as the rich in cases where cosmetic or functional repair is genuinely indicated."

#### MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MINNESOTA COURT FORFEITS CHARTER OF MEDICAL CORPORATION

State of Minnesota ex rel. Harry H. Peterson, Attorney General, vs. Pioneer Mutual Health and Benefit Insurance Company of Minnesota, a corporation.

On June 2, 1933, the Honorable John W. Boerner, Judge of the District Court for Ramsey County, filed an Order vacating the charter of the Pioneer Mutual Health and Benefit Insurance Company of Minnesota. This corporation was organized by three lay persons in the city of St. Paul, ostensibly for the purpose of "maintaining a health service or insurance." Their plan of operation was to issue so-called policies of insurance whereby the holder and others would get medical, surgical and dental services for \$1.50 per month by going to the office of the physicians, surgeons and dentists employed by the Company.

The Minnesota State Board of Medical Examiners, believing the said plan to be in violation of law insofar as the furnishing of medical and surgical services is concerned, obtained the cooperation of the Attorney General of the State of Minnesota, the Honorable Harry H. Peterson, with the result that a Quo Warranto proceeding was started against the corporation on April 17, 1933. The case was argued on May 13 and continued to May 18.

The Court granted the defendants a stay of forty days in the event they desire to appeal the case to the Supreme Court of Minnesota. The case was handled for the State by the Attorney General with the assistance of Roger S. Rutchick, Assistant Attorney General, and F. Manley Brist, Attorney for the State Board of Medical Examiners. The Medical Board wishes to acknowledge the splendid attitude shown in this case by the Attorney General and his staff. While Mr. Peterson has served only since the first of the year as Attorney General, he has made it very clear in the handling of this case that such an attempted evasion of the Medical Laws of this state will be promptly and firmly opposed by his department and that the work of the Medical Board in the enforcement of the Medical Act and the Basic Science law will be aided in every manner.

Once again it has been demonstrated that the practice of medicine and surgery is not a commercial field open to exploitation by lay persons but is a profession limited to those who are educated, skilled, examined and licensed.

#### APPEAL TO SUPREME COURT

John Granger vs. Minnesota State Board of Medical Examiners

An appeal has been taken to the Supreme Court of Minnesota by John Granger of Minneapolis, Minnesota, from an order entered January 3, 1933, by Judge Reed in the District Court of Hennepin County. Granger had previously started a lawsuit against the Medical Board seeking an injunction against the Board in his attempt to prevent what he refers to as the unlawful interference by the Board with his business. Mr. Granger is not licensed to practice medicine nor healing in the State of Minnesota, but has been engaged in conducting a so-called health audit business which consists of periodical urine analyses and blood pressure tests. Mr. Granger charges his subscribers \$10.00 per year for this service.

Judge Reed decided the case against Granger in the District Court, holding that Granger had not stated a cause of action against the Board. Briefs have been filed in the Supreme Court by both sides and the case will be one of the first to be heard by the Supreme Court when it reconvenes for its fall term in September. The State Board of Medical Examiners will be represented by the Honorable Harry H. Peterson, Attorney General, and F. Manley Brist, Special Assistant Attorney General.

#### ILLINOIS QUACK LEAVES STATE TO AVOID PROSECUTION

"Dr." Ray D. Smith, fifty-four years of age, who claimed that he came to St. Paul, Minnesota, from Clinton, Illinois, made a hasty departure from the State of Minnesota, on June 12, 1933, rather than stand trial in the District Court on a charge of practicing healing without a Basic Science Certificate.

For several days Smith has been maintaining a vending stand on the corner of Ninth and St. Peter streets. He would give a lecture about the human body using a wax model showing the internal organs. During his talk he explained that he had practiced medicine for twelve years and had spent two years at the Mayo Clinic, Rochester, Minn. Following an investigation made by the State Board of Medical Examiners, he was taken to police headquarters, where he retracted his statement about being a doctor and also denied having been at the Mayo Clinic. He was peddling a so-called Liberty Tonic which purportedly is manufactured by the Liberty Chemical Company, 260 Madison Ave., Memphis, Tennessee. The box is stamped "Clyde Collins Chemical Co., Memphis, Tennessee."

"Dr." Smith is driving a 1928 Nash coupe automobile with Illinois license plates for 1933 numbered 1082733. The serial number of the car is 440458; the motor number 323683. Smith stated at Police Headquarters that he was in Minnesota only temporarily and was on his way to North Dakota and Montana. Smith is accompanied by a lady about twenty-five years of age who he states is his wife.

If these people are seen anywhere in the State of Minnesota, kindly notify the Minnesota State Board of Medical Examiners, 524 Lowry Medical Arts Bldg., St. Paul, Minnesota, and a warrant will be issued for Smith's arrest.

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

*Speaker:* William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

July 5—Obesity and Heart Disease.

July 12—Chinese Medicine.

July 19—Insulin and Underweight.

July 26—Tumors of the Bladder.

### MINNESOTA RADIOLOGICAL SOCIETY

The annual meeting of the Minnesota Radiological Society was held in Rochester, Minnesota, May 22, 1933, in conjunction with the annual meeting of the Minnesota State Medical Association. The following program was presented:

1. Radiation Therapy in Non-Malignant Conditions  
GAGE CLEMENT, Duluth  
Discussion by WILHELM STENSTROM, Minneapolis
2. Correlative Value of Clinical and Pathological Findings in Roentgenological Diagnosis  
KANO IKEDA, St. Paul  
Discussion by CHARLES G. SUTHERLAND, Rochester
3. The Place of the Roentgenologist in the Private Practice of Medicine  
LEO G. RIGLER, Minneapolis  
Discussion by E. L. TUOHY, Duluth
4. Childhood Tuberculosis  
R. G. ALLISON, Minneapolis  
Discussion by C. A. STEWART, Minneapolis
5. Round Table Conference  
Roentgen Diagnostic Problems  
Conducted by B. R. KIRKLIN, Rochester

The following officers were elected for the coming year: President, Dr. Edward Schons, St. Paul; vice president, Dr. R. G. Allison, Minneapolis; secretary-treasurer, Dr. L. G. Rigler, Minneapolis.

### STEARNS-BENTON COUNTY SOCIETY

The staff of the United States veterans hospital at St. Cloud entertained the members of the Stearns-Benton Medical Society at a dinner and meeting Thursday, May 25, at the hospital.

About fifty doctors attended from Stearns, Benton, Wright, Meeker and Douglas counties.

Dr. Hans Hansen, superintendent of the hospital, Dr. George L. Mosby and Dr. L. M. Brown of the hospital staff produced the program, which consisted of a discussion of various types of mental conditions and afflictions.

The visitors enjoyed a visit through some of the buildings, particularly the new construction of the past year.

### AMERICAN CONGRESS OF PHYSICAL THERAPY

The American Congress of Physical Therapy announces its twelfth annual scientific and clinical session which will be held September 11 to 15, 1933, at the Palmer House, Chicago.

Each year these annual gatherings have increased in popularity. This is due to the splendid programs which are offered. This year efforts have been doubled to present a program which will appeal to every physician and technician engaged in the application of physical measures. Clinics and addresses deal with a variety of subjects, from the very fundamental to the more advanced. A large number of research reports will be made by prominent leaders in the field.

Physicians are urged to plan their vacations for this September session. The Century of Progress Exposition and this twelfth annual meeting of the Congress will make a week's stay in Chicago profitable and interesting.

As an unusually large attendance is anticipated those who plan to attend should make their hotel reservations as early as possible. Preliminary programs will be mailed on request. Write to the Executive Secretary, American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

## OBITUARY

### John Dexter Lyon 1875-1933

Dr. John Dexter Lyon, a practicing physician in Minneapolis for twenty years, died early Monday, May 29, 1933, of a heart ailment.

Born at Dexter, Iowa, in 1875, Dr. Lyon obtained his early education at the Iowa State Teachers College and Ames, spending a number of years subsequently as a teacher and school principal. He later entered Northwestern University to study medicine and was graduated in 1904. For nine years thereafter he practiced medicine in Chester, Iowa, and then opened an office in Minneapolis in 1913.

He was a staff member of St. Barnabas Hospital and taught physiology and anatomy to student nurses. He also was on the staff of the Asbury Hospital and was a member of the Hennepin County, Minnesota, State and American Medical Associations. His fraternal affiliations were in several Masonic organizations including the Knights Templar and Zuhrah temple.

Dr. Lyon is survived by his wife, three children, John D., Jr., Myrle C. and Ruth S. Lyon; three brothers, Charles W., of Des Moines, Iowa; Paul T., of Chicago and Ray B., of Paso Robles, Calif., and two sisters, Mrs. N. A. Richardson of Andover, Ohio, and Mrs. Rupert Bard of Gordon, Neb.



# PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of May 10, 1933

The regular monthly meeting of the Minnesota Academy of Medicine was held on Wednesday evening, May 10, 1933, at the Town and Country Club. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. C. D. Freeman.

There were fifty-eight members and five guests present.

Minutes of the April meeting were read and approved.

Upon ballot Dr. Paul O'Leary, Rochester, was unanimously elected to Associate Membership in the Academy.

The following scientific program was given.

DR. A. R. COLVIN (St. Paul) reported the following case:

## OSTEOMYELITIS OF THE ISCHIUM OF THE RAMUS

The case I wish to report this evening is interesting from the point of view of pathological anatomy and the rather unusual clinical symptoms. A girl fifteen years of age was admitted to the Ancker Hospital complaining of severe pain in the popliteal region and the calf of the leg. The lower extremity was held in outward rotation and attempts at inward rotation caused severe pain in the calf and popliteal region. Her temperature ranged from 101° to 103°. The movements of the hip joint, except internal rotation, were normal. There was no tenderness in the regions where the pain was felt; the pain was thus evidently a referred pain.

A study of the anatomy concerned explains the referred pain. The skin of the region of the calf and popliteal space is supplied by the obturator and lesser sciatic nerves. The external rotators of the hip, the gemelli and obturator muscles, take their origin from the ramus of the ischium surrounding the obturator foramen. From their origin here the tendons are slung around the ischial tuberosity and are inserted into the digital fossa on the inner surface of the trochanter major. Any attempt at internal rotation would exert a very direct pull on the ramus of the ischium. The muscles named are also supplied by the sacral plexus and obturator nerves.

Rectal examination revealed a tender, rather boggy feeling over the bone surrounding the obturator foramen. It is interesting that while tenderness was felt on palpation in the region of the obturator foramen, a pull on this region through the external rotator muscles caused pain only in the popliteal and calf regions.

From these findings it was concluded that we were dealing with osteomyelitis of the ramus of the ischium. An incision was made over the tuberosity of the ischium and a curved forceps passed up along the inner surface of the bone surrounding the obturator foramen. A small amount of pus was found. The forceps were then taken out and re-inserted along the outer surface of the bone and again a small amount of pus was obtained. Shortly after this her pain disappeared and internal rotation of the hip was again possible.

This case calls to mind another case of osteomyelitis of the same region which resulted finally in involvement of the body of the ischium and resulted in suppuration in the hip joint, with pathological dislocation.

DR. S. E. SWEITZER, Minneapolis, reported the following case of pellagra, and presented the patient.

## PELLAGRA, NON-ALCOHOLIC TYPE

This gentleman is one of fifty-seven cases of pellagra I have had in seven years. Of these fifty-seven cases, fifty-five have been of the type called alcoholic pellagra.

This year I have had two of the non-alcoholic type. This man had a fairly elaborate diet but had no appetite and did not eat much. He had bacon, eggs, bread, meat, potatoes and still he came in with a frank pellagra, with a bullous eruption on the backs of the hands. You can see now on the backs of his hands a thickened condition and the pigmentation that has remained.

This condition of avitaminosis is important for this reason, that in dieting efforts to reduce, it is very easily possible to get quite a serious pathological condition. This man did not have any symptoms at all except the skin symptoms. In pellagra it is possible to have just one symptom; in this individual, an eruption on the back of the hands. In limiting diets, one has to be careful that he does not cut out the vitamins.

The second case of the non-alcoholic type of pellagra was in a sheep herder who had lived principally on hardtack and bologna.

DR. E. L. GARDNER, Minneapolis, read a paper entitled

## CALCIUM DEFICIENCY ASSOCIATED WITH FUNCTIONAL GASTROINTESTINAL DISTURBANCES IN ADULTS

### DISCUSSION

DR. R. T. LAVAKE (Minneapolis): I would not take the liberty of discussing this paper were it not for the facts that this question of calcium metabolism is a hobby of mine and has from my experience become a matter of importance in my practice of obstetrics and gynecology. It has become a hobby because I came from a family in which spasmophilia and low calcium balance is rife, and I myself have had to consider my calcium balance for my own comfort. Calcium deficiency is a subject the importance of which, from my observation, is too frequently overlooked.

Dr. Gardner has brought out particularly the more marked cases of calcium deficiency, cases that can be demonstrated by x-rays or have marked symptoms. I would like to bring to your attention the importance of keeping in mind the frequent manifestation of minor grades of calcium deficiency. In obstetrics, this deficiency frequently manifests itself in muscle cramps, Chvostek's sign, headaches, and other tetanoid symptoms and signs. This heightened nerve irritability is a condition that is difficult for one to appreciate who has not been subject to it. To one low in calcium, if someone makes an unexpected noise, one feels like reflexly hitting him with the first article in sight. A few weeks of high calcium intake plus Vitamin D or sunlight and one feels as calm as can be. This change in nerve excitability is most startling. These minor symptoms may obtain in the presence of an apparently normal blood calcium estimation.

In the April 1, 1933, issue of the *Journal of the American Medical Association*, Alice R. Bernheim has an article on calcium metabolism that is worth your perusal. It is her opinion that the diet of most people in this country is deficient in calcium. The question is raised as to whether reputed longevity of Bulgarian peasants is not due to the high calcium intake rather than to the much-heralded bacillus of Metschnikoff. Experiments on rats point to a relative longevity of calcium-high rats over calcium-deficient rats.

So many of my gynecologic patients come in with peculiar headaches and general nerve irritability, especially demonstrable by Chvostek and Trousseau signs and other heightened reflexes. On these, I use calcium therapy even though the blood calcium is apparently normal. In the majority of instances results are striking.

ing. Headaches leave and the patient becomes more calm.

Dr. Gardner mentions menorrhagia, which is a frequent concomitant of calcium deficiency. If menorrhagia continues after diagnostic curettage, one should never remove a fibromyomata uterus for hemorrhage alone until he has thoroughly tried out a high calcium regime. Much meddlesome surgery will in this way be eliminated.

I feel that this is one of the most important subjects that we have had discussed in this Society for some time and would urge you to give it your very careful consideration.

DR. GUSTAV SCHWYZER (Minneapolis): As long as Dr. LaVake excuses himself in discussing this subject because he is a gynecologist, I can do the same because of the veterinary work I am doing of late. I became familiar with this deficiency of calcium in my own cattle. Possibly you may not be familiar with this fact, but the so-called milk fever which has killed so many cattle has been studied and it has been found that it is due to calcium deficiency. The original thought came from England, and the Minnesota University Farm has done some of the early work. The veterinarian today uses a 10 per cent calcium chloride solution, 100 c.c. injected under the skin or intravenously. A cow that is dying, after being given this calcium chloride, will in twenty minutes be up on her feet and feeding. I have had the experience of observing such results with my own cattle.

I thought it might interest you to know that, in addition to what we have learned from Dr. Gardner and Dr. LaVake tonight, this calcium deficiency is found in cattle also.

DR. GARDNER (in closing): A good way to check the diagnosis of calcium deficiency in suspected cases is to x-ray the hand along with a control on the same x-ray film. After treatment this method of examination may be checked and you will find an increase of density along with an improvement of the patient's general condition. It seems that much of our former speculation about the presence of calcium deficiency is justified by these radiographic studies. The extreme case may possibly be non-tropical sprue.

There are just two points to which I would like to call your attention. *First*, what relation has calcium deficiency to water supply? Does water in some localities supply considerable lime besides the dietary, and, if so, is there any excess of magnesium in the same supply? Some of the artesian wells in the Northwest and even in Minneapolis show considerable amounts of magnesium salts. *Second*, I believe we should reserve our conclusions as to the presence of almost universal tendency to a calcium dietary deficiency until after an allowance is made for this water supply.

I have tried in this discussion to keep away from speculation and deal only with objective facts. My impression is that mild cases of calcium deficiency are very common, but we have no absolute proof.

I wish to thank the gentlemen for their discussion.

Dr. H. E. MICHELSON, Minneapolis, gave a lantern slide talk on

#### THE TUBERCULODERMAS OF THE FACE

Tuberculosis of the skin is not a common condition in Minnesota, while in continental clinics lupus vulgaris in particular is seen very often. The same causative agent produces, in different individuals who are affected, a very different clinical manifestation.

The face is the most common location for tuberculosis of the skin. The type of lesion varies greatly, and the factors that bring about this variation are probably the state of receptivity of the host and the number and manner in which the bacilli are deposited in the

skin. Pre-existing dermatoses and the circulatory type of the individual undoubtedly also play a role.

#### DISCUSSION

DR. S. E. SWEITZER (Minneapolis): I wish to congratulate Dr. Michelson on this excellent presentation. The subject of tuberculosis as manifested in the skin is interesting from the fact that we see so little of it. In Europe one sees a tremendous amount of skin tuberculosis. There are various explanations for this, i.e., the dwellings are so old and there are a lot of germs in the dwellings, the food is not so good as it is here, and they do not have so much sunshine. Also, in Europe they have developed more of an immunity to tuberculosis, and lung tuberculosis is not so severe. Here skin tuberculosis is not so severe; therefore, in Minnesota we should have more lung tuberculosis and not so much skin tuberculosis. For fifteen years I was connected with a tuberculosis institution and was amazed to see how few patients who had lung tuberculosis also had skin tuberculosis. The few cases we have picked up through all these years are those Dr. Michelson has seen at the University and I have had a few at the General Hospital. But we see very few, comparatively. Day after day goes by without seeing a case of skin tuberculosis. In Europe one can hardly go through any hospital without seeing a number of cases of tuberculosis of the skin. There must be some reason for this.

As to the question of nomenclature, we think these are all due to the same organism. We give various names for distinction in diagnosis. The cases differ histologically a little bit and also differ in the kind of treatment we wish to give them. They vary in these respects although they are due to the same organism.

The interesting thing in my experience is that we see so few cases of tuberculosis of the skin, and the ones we do see are largely lupus vulgaris, a few tuberculids, and some sarcoïd. We see very few of these other cases mentioned. I have not been able to figure out any reason other than that patients in Europe are more strongly immunized and so have a greater tendency to skin manifestations.

The meeting adjourned.

R. T. LAVAKE, M.D.

#### BOOK REVIEW

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE GOLD-HEADED CANE. William Macmichael. Edited by H. S. Robinson. 223 pages. Illus. Price \$3.50. New York: Froben Press, Inc., 1932.

Mrs. Baillie, widow of a famous English physician (Lives of British Physicians, London, John Murray, 1830), presented to the College of Physicians a gold-headed cane which had been successively carried by the Doctors Radcliffe, Mead, Askew, Pitcairn and Baillie. Dr. Macmichael endowed the cane with consciousness and the five chapters of The Gold-Headed Cane are its narrative of the professional lives of these physicians. The book, the first edition of which was published in 1827, is an entertaining sketch of English medical history from 1689 to 1823.

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